

I-70 EAST

SUPPLEMENTAL DRAFT ENVIRONMENTAL IMPACT STATEMENT AND SECTION 4(F) EVALUATION

WETLANDS AND OTHER WATERS OF THE U.S. TECHNICAL REPORT

ATTACHMENT N

AUGUST 2014

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List of acronyms

AB Aquatic bed (submerged or aquatic vegetation)

BMP Best management practice

CDOT Colorado Department of Transportation

CFR Code of Federal Regulations
CDOW Colorado Division of Wildlife

CWA Clean Water Act

Denver City and County of Denver

EIS Environmental Impact Statement
EPA Environmental Protection Agency

FACWet Functional Assessment of Colorado Wetlands

FHWA Federal Highway Administration

FR Federal Register

FTA Federal Transit Administration
GIS Geographic information system

GPS Global positioning system

MOA Memorandum of Agreement

NEPA National Environmental Policy Act

NRCS Natural Resource Conservation Service

NWW Non-wetland waterway
OHWM Ordinary high water mark

PACT Preferred Alternative Collaboration Team

PEM Palustrine emergent
PSS Palustrine scrub-shrub

RTD Regional Transportation District

SAFETEA-LU Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users

U.S. United States

USACE U.S. Army Corps of Engineers

USC United States Code

USDOT U.S. Department of Transportation
USFWS U.S. Fish and Wildlife Service

WRCC Western Regional Climate Center

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1. Introduction

The I-70 East Environmental Impact Statement (EIS) is a joint effort between the Federal Highway Administration (FHWA) and the Colorado Department of Transportation (CDOT). The intent of the EIS is to identify potential highway improvements along I-70 in the Denver metropolitan area between I-25 and Tower Road and to assess their potential effects on the human and natural environment.

1.1. Project limits

As shown on Figure 1, the project limits extend along I-70 between I-25 and Tower Road. The project area covers portions of Denver, Commerce City, Aurora, and Adams County. This area includes the neighborhoods of Globeville, Elyria and Swansea, Northeast Park Hill, Stapleton, Montbello, and Gateway. The portion of Aurora in the project area is referred to as the Aurora Neighborhood in this report. Each resource has a specific study area based on the resource.

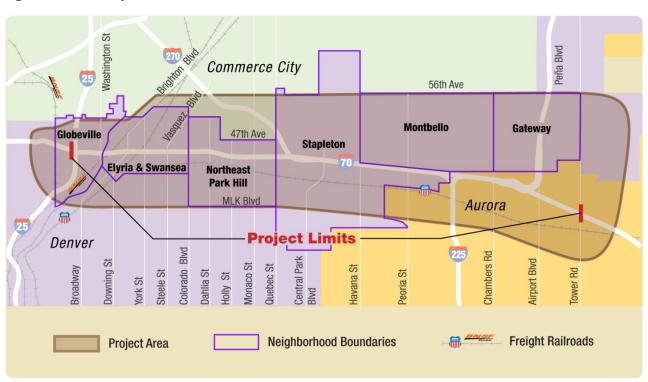


Figure 1. Project area

1.2. Project background

Analysis of I-70 began in June 2003 as part of the I-70 East Corridor EIS, a joint effort conducted by CDOT, FHWA, the Regional Transportation District (RTD), the Federal Transit Administration (FTA), and the City and County of Denver (Denver). In June 2006, CDOT and RTD determined that the highway and transit elements of the I-70 East Corridor EIS process serve different travel markets, are located in different corridors, and have different funding sources. Therefore, the highway and transit components of the analysis were separated. After the project separation, the alternatives that made it through the screening process by addressing the purpose and need of the project were fully evaluated in the Draft EIS, published in November of 2008. With the release of the 2008 Draft EIS, the public and agencies had an opportunity to review and comment on it. Public hearings were held to present the information and encourage formal comments. Due to the complexity of the project and the extensive amount of public comments received during the formal

comment period, the project team decided to form the Preferred Alternative Collaborative Team (PACT) as part of a collaborative process with project stakeholders to recommend a preferred alternative. Through this collaborative process, additional analysis was performed, which resulted in the elimination of two previous alternatives and the addition of a new alternative option.

Because more than four years have passed since the 2008 Draft EIS was first published, many federal and state regulations and requirements have changed. Additional analysis and public involvement efforts were performed to determine the validity of the alternatives that were considered reasonable alternatives in the 2008 Draft EIS. Based on the public comments, the additional analysis, and the PACT collaborative process, the project team determined that the realignment alternatives were no longer reasonable. Consequently, a new alternative was designed to address the public concerns and incorporate their comments. Due to the changes in the alternatives, outdated census data, and new federal and state laws and regulations, the analysis in the 2008 Draft EIS was revisited and a Supplemental Draft EIS was written.

This report discusses wetlands and other waters of the U.S., including existing conditions in the corridor, resource effects analysis, and mitigation measures.

2. Resource definition

Wetlands are specifically defined as areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Wetlands boundaries are delineated by the presence of hydrophytic vegetation and soil, in addition to the presence of hydrologic indicators (33 CFR §328).

The term "waters of the U.S." is generally defined as all waters that are currently used, were used in the past, or may be susceptible in the future for use in interstate or foreign commerce. According to 33 Code of Federal Regulations (CFR) §328, this includes territorial seas, intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, wet meadows, natural ponds, and all tributaries of those waters. Waste treatment systems—including treatment ponds or lagoons designed to meet the requirements of the Federal Water Pollution Control Act amendments of 1972 (Public Law Number [Pub. L. No.] 92-500), as amended by the Clean Water Act (CWA) of 1977 (33 United States Code [USC] §§1251–1387)—are not waters of the U.S. The boundaries of waters of the U.S., other than wetlands, are delineated by their bed, bank, and ordinary high water mark (OHWM).

All navigable waters, major rivers, and perennial creeks are considered to be under U.S. Army Corps of Engineers (USACE) jurisdiction. Other water bodies, including wetlands and man-made features, are subject to review by the USACE to determine their jurisdiction.

3. Applicable laws, regulations, and guidance

This section discusses applicable laws, regulations, and guidance as they pertain to the analysis of wetlands and waters of the U.S.

3.1. Clean Water Act and Section 404 program

The primary vehicle for wetland protection and regulation in the United States is Section 404 of the CWA of 1977, which set the basic structure for regulating discharge of pollutants to waters of the U.S. This section established a program to regulate the discharge of dredged material and fill material into waters of the U.S., including wetlands. Anyone dredging or filling waters of the U.S. must request a permit from the USACE.

3.2. National Environmental Policy Act

The National Environmental Policy Act (NEPA) of 1969, as amended (42 USC §4321 et seq., Pub. L. No. 91-190, 83 Stat. 852), requires federal agencies to integrate environmental values into their decision-making processes by considering the environmental effects of their proposed actions and reasonable alternatives to those actions. NEPA also requires that agencies making such decisions consult with other agencies and involve the public, disclose information, investigate the environmental effects of a reasonable range of alternatives, and prepare a detailed statement of the environmental effects of the alternatives.

3.3. NEPA/Section 404 Merger Agreement

The NEPA/Section 404 Merger Agreement was signed by CDOT, USACE, and FHWA in May 2003 and updated in August 2008. This agreement was established to determine a coordination and documentation protocol in situations where these agencies have authority over the same transportation project.

3.4. Colorado Department of Public Health and Environment, Water Quality Control Commission, Regulation 82—Section 401 certification regulation

Certification by the State of Colorado under Section 401 of the CWA is required for issuance of federal permits for projects that may result in a discharge to waters of the U.S. in Colorado. Through this regulation, the State of Colorado can ensure that the quality of Colorado's waterways is protected. At this time, this requirement applies to USACE individual Section 404 permits, but not nationwide permits (5 Code of Colorado Regulations [CCR] 1002-82).

3.5. Executive Order 11990—Protection of Wetlands

President Carter issued Executive Order (EO) 11990, "Protection of Wetlands," in May 1977, establishing the protection of wetlands and riparian systems as the official policy of the federal government. EO 11990 requires all federal agencies to consider wetland protection as an important part of their policies.

3.6. Executive Order 11988—Floodplain Management

EO 11988 requires all federal agencies to take actions to reduce the risk of loss due to flood; to minimize the impact of floods on human safety, health, and welfare; and to restore and preserve the natural and beneficial values served by floodplains while carrying out the following agency responsibilities:

- Acquiring, managing, and disposing of federal lands and facilities
- Funding construction or improvements
- Conducting activities or programs affecting land use

The EO also provides additional guidance to help agencies implement this initiative.

3.7. Fish and Wildlife Coordination Act, as amended

The Fish and Wildlife Coordination Act of 1934, as amended (16 USC §§661-667e), states that whenever the waters or channel of a body of water are modified by a department or agency of the United States, the department or agency shall first consult with the U.S. Fish and Wildlife Service (USFWS) and with the head of the agency exercising administration over the wildlife resources of the state where construction would occur, with a view to the conservation of wildlife resources. The Fish and Wildlife Coordination Act provides that land, water, and interests may be acquired by federal agencies for wildlife conservation and development. In addition, real property under jurisdiction or control of a federal agency that is no longer required by that agency may be used for wildlife conservation by the state agency exercising administration over wildlife resources upon that property.

3.8. Safe, Accountable, Flexible, Efficient Transportation Equity Act of 2005: A Legacy for Users

The Safe, Accountable, Flexible, Efficient Transportation Equity Act of 2005: A Legacy for Users (SAFETEA-LU) prescribes a new environmental review process for highway, public transportation capital, and multimodal projects. The law specifies changes from current NEPA procedures, and it applies to all highway and transit EISs with a Notice of Intent published after August 11, 2005.

3.9. FHWA Technical Advisory T6640.8A

The FHWA Technical Advisory T6640.8A states that when an alternative will impact wetlands, the EIS should identify the wetlands (including function), describe the impacts, evaluate alternatives that would avoid the wetlands, and identify practicable measures to minimize harm to the wetlands. The technical advisory continues by noting that during the impacts evaluation, the EIS should address the importance of the impacted wetlands and the severity of those impacts. This evaluation should consider several factors, including functionality, importance to the surrounding ecosystem, and uniqueness.

3.10. 23 Code of Federal Regulations Part 777, Mitigation of Impacts to Wetlands and Natural Habitat

The purpose of this regulation is to provide policy and procedures for the evaluation and mitigation of adverse environmental impacts to wetlands and natural habitat resulting from federal-aid projects funded pursuant to provisions of title 23, USC. These policies and procedures shall be applied by FHWA to projects under the Federal Lands Highway Program to the extent that such application is deemed appropriate by FHWA (65 Federal Register [FR] 82924).

3.11. 40 Code of Federal Regulations Part 230, Compensatory Mitigation for Losses of Aquatic Resources

In April 2008, the USACE and Environmental Protection Agency (EPA) jointly issued this regulation to establish performance standards and criteria for the use of permittee-responsible compensatory wetland mitigation, wetland mitigation banks, and in-lieu fee programs to improve the quality and success of compensatory wetland mitigation for impacts authorized by the Department of the Army (73 FR 19594).

3.12. 1990 Memorandum of Agreement Between the U.S. Environmental Protection Agency and the Department of the Army Concerning the Determination of Mitigation Under the Clean Water Act, Section 404(b)(1)

The purpose of the EPA/Department of the Army Memorandum of Agreement (MOA) concerning mitigation under the CWA is to provide policy and procedures to help users determine the type and level of mitigation necessary to demonstrate compliance with Section 404(b)(1) of the CWA. The MOA also expresses the intent of the agreeing parties to meet the objective of the CWA to restore and maintain the chemical, physical, and biological integrity of waters of the U.S., including wetlands.

3.13. Colorado Division of Wildlife and CDOT 2005 Memorandum of Agreement on the Administration and Implementation of Senate Bill 40

In the Colorado Division of Wildlife (CDOW) and CDOT 2005 MOA on the Administration and Implementation of Senate Bill 40, CDOW and CDOT agreed that future transportation construction and maintenance activities described in Senate Bill 40 may be undertaken without written certification from

CDOW. The parties also agreed that all other activities that impact any stream or its banks or tributaries will require CDOW certification.

3.14. U.S. Army Corps of Engineers wetlands delineation manuals

The USACE *Wetlands Delineation Manual* (1987) provides technical guidelines for identifying wetlands and distinguishing them from aquatic habitats and other non-wetlands. The purpose of this manual is to provide users with guidelines and methods to determine whether an area is a wetland for purposes of Section 404 of the CWA. In 2010, the USACE came out with the final version of a regional supplement to the 1987 *Wetlands Delineation Manual* that is applicable to the project area. This regional supplement provides more specific guidance for the wetland delineations in the project area and is entitled, *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region* (USACE, 2010).

4. Existing conditions

This section defines the methodology used to identify wetlands and waters of the U.S. and describes the existing conditions of those resources in the project area.

4.1. Methodology

The following describes the methodologies used in this technical report.

4.1.1. Wetland and non-wetland waterway determination

Building on previous efforts in the corridor, an Atkins wetland scientist surveyed the project area for wetlands on September 1 and 2, 2012, November 6, 2012, and November 8, 2012. A Pinyon wetland scientist surveyed additional areas on April 12, 2013, and November 18, 2013. The *Corps of Engineer's Wetland Delineation Manual* (Environmental Laboratory, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region* (USACE, 2010) guided the methods used onsite.

Vegetation was assessed at each wetland and upland sample point. The indicator status of vegetation was derived from the *National Wetland Plant List: Great Plains Region* (Lichvar, 2012). "Hydrophytic" qualifies where greater than 50 percent of the dominant plant species have an indicator status of obligate, facultative wet, and/or facultative vegetation cover. Upland qualifies where 50 percent or greater of the dominant plant species classify as upland and/or facultative upland vegetation cover.

Soil pits were excavated by hand and hydric soil indicators analyzed at most wetland and upland data points. Wetlands must meet the qualifications of at least one hydric soil indicator. This definition states that a hydric soil is a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (U.S. Department of Agriculture, 1994). There are 19 hydric soil indicators, including features such as soil matrix color depletions, inclusions of oxidation-reduction concentrations, or thick organic layers (NRCS, 2010). Soil types within the project area were obtained from the *Web Soil Survey* (NRCS, 2012). Soil types were not available within Denver County.

According to the Western Regional Climate Center (WRCC) (2012), the freeze-free period for 50 percent of the time at 28.5 degrees Fahrenheit at the Denver International Airport is roughly 180 days long. This is equivalent to the growing season defined by NRCS. Based on this information, the expected minimum duration needed for a site to exhibit wetland hydrology (e.g., soil saturation/inundation) is about 9 days, or 5 percent of the growing season. Primary and secondary hydrologic indicators were assessed at each wetland and upland sample point; the occurrences of one primary indicator or two secondary indicators are required to qualify the area as a wetland. There are 19 primary hydrology indicators, such as saturation within 12 inches of the ground surface,

sulfidic odor (rotten egg odor), watermarks, drift deposits, and sediment deposits. There are nine secondary hydrology indicators, including water-stained leaves, drainage patterns, and a dry-season water table between 12 to 24 inches below the surface during the normal dry season (USACE, 2010).

The term non-wetland waterway (NWW) is a non-regulatory term used by Atkins to identify channels that have been scoured of vegetation below an OHWM, or exhibit a drainage pattern (water conveyance channel). NWW channels occur in rivers, streams (perennial, intermittent, or ephemeral), canals, ditches, and overflow channels. NWWs were mapped in a geographic information system (GIS) and observed during the field survey.

4.1.2. Mapping

Mapping was completed in the field and in the office between I-25 and Tower Road, generally within 50 feet of the existing edge of pavement or within 50 feet of the proposed construction limits. One exception to this is in the Sand Creek area, north of I-70, where the project area extends from I-70 northward to East 47th Avenue. Field mapping completed by Atkins and Pinyon in the project area was done using a Trimble GeoXT resource grade global positioning system (GPS), using the World Geodetic Survey 1984 datum. Points were taken at all sample points. Data were differentially corrected using Pathfinder Office 5.0 with base station data received from the continuously operating reference stations at CDOT in Golden, Colorado. GPS data accuracy was verified through comparison of data to observable features on the aerial photograph. Mapping in the office was completed by digitally tracing relevant features observed on recent aerial photography in a GIS. Unique wetland identifiers (i.e., labels) were created by sequentially numbering wetlands with each mile of I-70, based on milepost. For example, a wetland found between I-70 mileposts 278 and 279, was labeled 278-01; the second wetland found between mileposts 278 and 279 was labeled 278-02, and so on.

4.1.3. Wetland classification and functional assessment

Wetland functions were assessed using CDOT's Functional Assessment of Colorado Wetlands (FACWet) method (Johnson et al., 2011). FACWet is a rapid assessment methodology that rates wetland condition through evaluation of ecological stressors and their effects on nine state variables that drive wetland functioning. Stressors are used as indicators of functional impairment. Variables are rated on a scale of 0.1 (low) to 1.0 (high) according to the level of departure between their currently observed condition and their natural or reference standard condition. State variables then are related to the seven functions over which they have primary control and are used to index the capacity of seven societally important functions (Johnson et al., 2011). The following seven functions are evaluated by FACWet:

- 1. Support of characteristic wildlife habitat
- 2. Support of characteristic fish/aquatic habitat
- 3. Flood attenuation
- 4. Short- and long-term water storage
- Nutrient/toxicant removal
- 6. Sediment retention/shoreline stabilization
- 7. Production export/food chain support

In general, the following scoring category descriptions apply to variable and function scores:

- 0.9–1.0 Reference standard
- 0.8–<0.9 Highly functioning
- 0.7–<0.8 Functioning
- 0.6–<0.7 Functioning impaired
- <0.6 Non-functioning

Wetlands were classified according to the hydrogeomorphic (HGM) classification method (Smith et al., 1995). Three criteria are used to identify HGM class: (1) geomorphic position (position in the landscape topography); (2) primary water source (precipitation, overbank surface flow, or groundwater); and (3) hydrodynamics (energy and direction of water flow through the wetland).

All wetlands also were classified into one or more of the wetland classifications used by the USFWS (Cowardin et al., 1979). These classifications include herbaceous palustrine emergent (PEM), palustrine scrub-shrub (PSS), palustrine forested, and aquatic bed (AB) (submerged or aquatic vegetation).

4.2. Findings

This section presents the results of the wetland and other waters of the U.S. survey in the project area. Maps showing the location, extent, and projected impacts to waters of the U.S. are provided in Appendix A, photographs are provided in Appendix B, wetland delineation forms are provided in Appendix C, and FACWet forms are provided in Appendix D.

4.2.1. Wetlands

A total of 38 wetlands, totaling roughly 6.3 acres, were identified within the project area (see Table 1). The USACE made a jurisdictional determination (NWO-2013-1163-DEN) on July 9, 2013, for 37 wetlands; the remaining wetland (WET-Culv02) was delineated after a jurisdictional request was made and the final jurisdictional determination will be made by the USACE (see Appendix E). However, at this time, it appears that jurisdictional wetlands (approximately 0.98 acre) occur along the South Platte River and Sand Creek, and that the remaining 5.32 acres of wetlands that are associated with stormwater detention basins or roadside ditches will likely be determined to be non-jurisdictional.

Wetlands within the project area were the floristically simple emergent and scrub-shrub wetlands typical of urban environments along the Front Range of Colorado. While the specific characteristics of the existing plant communities vary, commonly encountered plant species include cattails (*Typha* sp.), bulrushes (*Schoenoplectus* sp.), barnyard grass (*Echinochloa crus-galli*), spike rushes (*Eleocharis* sp.), smartweeds (*Polygonum* sp.), western dock (*Rumex crispus*), coyote willow (*Salix exigua*), and plains cottonwood (*Populus deltoides*) trees (see Appendix C).

Table 1. Summary of wetlands found within the project area

Wetland ID	Figure No. ^a	Sample Point(s) ^b	Photo No. ^c	USFWS Type ^d	HGM Class ^e	JD	Size (acre)	Notes
WET-S Culv02	1	SP5	N/A	PEM	D	Juris. ^f	0.003	Stormwater basin
WET274-01	1	274-02	1	PEM/PSS	R	Juris.	**	S. Platte fringe
WET274-02	1	274-02	2	PEM	R	Juris.	0.021	S. Platte fringe
CDOT Wtlnd Mit.Site	3	N/A	N/A	PEM	D	Juris.	0.171	Drains to Sand Creek
WET278-01	3	278-01	3	PEM	D	Juris.	0.019	Stormwater basin
WET278-02	3	278-02	4	PSS	R	Juris.	0.105	Sand Creek fringe
WET278-03	3	278-08	5	PEM	R	Juris.	0.085	Sand Creek fringe
WET278-04	3	278-08	6	PEM	R	Juris.	0.039	Sand Creek fringe
WET278-05	3	278-02	7	PSS	R	Juris.	0.103	Sand Creek fringe
WET278-06	3	278-02	8	PSS	R	Juris.	0.048	Sand Creek fringe
WET278-07	3	278-02	9	PSS	R	Juris.	0.129	Sand Creek fringe
WET278-08	3	278-08	10	PEM	R	Juris.	0.071	Sand Creek fringe
WET278-09	3	278-08	11	PEM	R	Juris.	0.095	Sand Creek fringe
WET278-10	3	278-02	12	PSS	R	Juris.	0.030	Sand Creek fringe
WET278-11	3	278-02	13	PSS	R	Juris.	0.027	Sand Creek fringe
WET278-12	3	278-02	14	PSS	R	Juris.	0.029	Sand Creek fringe
WET279-01	3	279-01	15	PEM	D	Non-juris.	1.338	Stormwater basin
WET279-02	4	279-02	16	PEM/PSS	D	Non-juris.	**	Stormwater basin
WET280-01	4	280-02	17	PEM	D	Non-juris.	0.115	Stormwater basin
WET280-02	4	280-02	18	PEM	D	Non-juris.	0.091	Stormwater basin
WET280-03	4	280-02	19	PEM	D	Non-juris.	**	Stormwater basin
WET280-04	5	280- 04a,b	20	PEM	D	Non-juris.	0.236	Stormwater basin
WET280-05	5	280-05	21	PEM	D	Non-juris.	0.022	Roadside ditch
WET280-06	5	4-12-13	22	PEM	D	Non-juris.	0.019	Roadside ditch

Wetland ID	Figure No. ^a	Sample Point(s) ^b	Photo No. ^c	USFWS Type ^d	HGM Class ^e	JD	Size (acre)	Notes
WET280-07	5	4-12-13	23	PEM	D	Non-juris.	0.044	Roadside ditch
WET280-08	5	280-08	24	PEM	D	Non-juris.	0.012	Roadside ditch
WET281-01	6	281-01	25	PEM	D	Non-juris.	0.024	Roadside ditch
WET281-02	6	281-01	26	PEM	D	Non-juris.	0.004	Roadside ditch
WET281-03	6	281-01	27	PEM	D	Non-juris.	0.022	Roadside ditch
WET281-04	7	281-04	28	PEM	D	Non-juris.	0.008	Roadside ditch
WET281-05	7	281-04	29	PEM	D	Non-juris.	0.024	Roadside ditch
WET281-06	7	281-04	30	PEM	D	Non-juris	0.013	Roadside ditch
WET281-07	8	281- 07a,b	31	PEM/PSS	D	Non-juris.	0.521	Stormwater basin
WET282-01	9	282-01	32, 33	PEM/PSS	D	Non-juris.	2.609	Stormwater basin
WET284-01	10	284-01	34	PEM	D	Non-juris.	0.148	Roadside ditch
WET285-01	11	285-01	35	PEM	R	Non-juris.	0.010	Roadside ditch
WET285-02	11	285-02	36	PSS	R	Non-juris.	0.034	Roadside ditch
WET285-03	12	285-03	37	PEM	R	Non-juris.	0.003	Roadside ditch
WET285-04	12	285-04	38	PEM	R	Non-juris.	0.012	Roadside ditch
WET285-05	12	285-05	39	PSS	R	Non-juris.	**	Roadside ditch
WET285-06	12	285-06	40	PEM	D	Non-juris.	0.015	Roadside ditch
						Total	6.299	

^a Figures are provided in Appendix A. Note that construction limits shown on the figures generally represent both General-Purpose and Managed Lanes Options. However, worst-case scenario construction limits (Managed Lanes Option) is reflected on all figures east of Colorado Boulevard.

Wetland hydrology of wetlands found along the South Platte River and Sand Creek is supported primarily by overbank flooding. At Sand Creek, the alluvial aquifer also appears to be supporting wetland hydrology. In the stormwater detention ponds and roadside ditches, the wetland hydrology is supported primarily by precipitation and associated stormwater runoff, though groundwater also may be contributing to hydrology at some locations.

The two small wetlands that occur as a narrow fringe along the South Platte are considered to be functioning at such a low level that they may as well be non-functional (see Table 2). All other wetlands are considered to be functionally impaired, with the exception of two roadside ditches considered to be functioning. Consistent for all sites, the reason for these low levels of functionality is directly attributed to their occurrence in Denver's urban environment. Though they may have a low level of functionality compared to their reference standards, these wetlands are providing several important functions. For example, stormwater and

^b Data forms are provided in Appendix C.

^c Photographs are provided in Appendix B.

^d PEM = palustrine emergent; PSS = palustrine scrub-shrub. After Cowardin et al., 1979.

^e D = depressional; R = riverine. After Smith et al. (1995).

^f This wetland was delineated after a formal jurisdictional determination was made for the remaining 37 wetlands; therefore, this determination is preliminary. USACE will make the final jurisdictional determination for this wetland.

^{**} The wetland boundaries are outside of the project area. These wetlands were delineated in the field but occur outside of the designated project area. They are included here for completeness; however, the acreages of these wetlands are not included in project totals.

roadside ditch wetlands provide an important nutrient/toxicant removal function, and though they are degraded, the wetlands along Sand Creek are important wildlife habitat to resident wildlife.

Table 2. Summary of wetland functions performed by wetlands in project area

Assessment Area Grouping	Support of Characteristic Wildlife Habitat	Support of Characteristic Fish/Aquatic Habitat	Flood Attenuation	Short- and Long-Term Water Storage	Nutrient/Toxicant Removal	Sediment Retention/Shoreline Stabilization	Production Export/Food Chain Support	Composite Functional Capacity Index (FCI) Score
South Platte fringe	0.360	0.489	0.444	0.483	0.475	0.400	0.457	0.444
Sand Creek	0.652	0.654	0.652	0.657	0.660	0.668	0.664	0.658
Stormwater	0.628	0.689	0.681	0.692	0.675	0.652	0.677	0.670
Globeville Landing Park spillway (WET- Culv02)	0.640	0.710	0.710	0.730	0.690	0.680	0.670	0.690
Roadside ditches WET280-05, WET281-01 to 281- 06, WET284-01, and WET285-01 to 281-06	0.660	0.606	0.606	0.600	0.613	0.620	0.643	0.621
Roadside ditch WET280-06	0.630	0.750	0.720	0.760	0.620	0.710	0.740	0.700
Roadside ditch WET280-07	0.620	0.760	0.720	0.770	0.620	0.720	0.760	0.710
Roadside ditch WET280-08	0.540	0.740	0.690	0.750	0.600	0.630	0.680	0.660

FACWet scoring: 0.9–1.0 reference standard; 0.8–<0.9 highly functioning; 0.7–<0.8; functioning; 0.6–<0.7 functioning impaired, <0.6 non-functioning.

4.2.2. Other waters of the U.S.

Three waters of the U.S. other than wetlands were identified in the project area: the South Platte River (OW274-01, OW-N_Culv, and OW-S_Culv), an existing spillway stormwater basin at Globeville Landing Park (OW-Culv02), and Sand Creek (OW278-01). Roughly 0.602 acre of the South Platte River channel and 4.183 acres of the Sand Creek river channel occur in the project area. Both rivers are perennial, sand bed streams that generally flow in a northerly direction. The existing spillway in Globeville Landing Park includes a stormwater detention pond (approximately 0.022 acre), which is connected to the South Platte River by surface water flow.

5. Description of alternatives

The I-70 East Supplemental Draft EIS examines potential effects to social, environmental, and economic resources resulting from proposed improvements to I-70 between I-25 and Tower Road. Consistent with federal regulations, the Supplemental Draft EIS fully evaluates potential effects that might result from the No-Action Alternative and the Build Alternatives (Revised Viaduct Alternative and Partial Cover Lowered Alternative). The alternatives and options are presented in Table 3.

For more detail on the alternatives and their options; see the *I-70 East Supplemental Draft EIS Alternative Analysis Technical Report* (2014).

Alternative		Expansion Options	Connectivity Options	Operational Options
No-Action		NorthSouth	N/A	N/A
Build	Revised Viaduct	North South	N/A	General-Purpose Lanes Managed Lanes
Build Alternatives	Partial Cover Lowered	N/A	Basic Modified	General-Purpose LanesManaged Lanes

No-Action Alternative

The No-Action Alternative replaces the existing viaduct between Brighton Boulevard and Colorado Boulevard without adding any capacity; the remainder of the corridor will reflect current conditions and include existing, planned, and programmed roadway and transit improvements (such as FasTracks) in the study area. The No-Action Alternative is shown in Figure 2.

Figure 2. No-Action Alternative



Build Alternatives

Build Alternatives add capacity to I-70 by constructing additional lane(s) or restriping between I-25 and Tower Road.

Revised Viaduct Alternative. The Revised Viaduct Alternative is shown in Figure 3. This alternative replaces the existing I-70 viaduct between Brighton Boulevard and Colorado Boulevard. It adds two additional lanes in each direction from Brighton Boulevard to Tower Road. It also adds capacity from I-25 to Brighton Boulevard.

Figure 3. Revised Viaduct Alternative



Partial Cover Lowered Alternative. The Partial Cover Lowered Alternative is shown in Figure 4. This alternative removes the existing I-70 viaduct between Brighton Boulevard and Colorado Boulevard, lowering the highway below grade in this area, while adding two additional lanes in each direction from Brighton Boulevard to Tower Road. This alternative includes a cover over the highway between Clayton Street and Columbine Street. The alternative also adds capacity from I-25 to Brighton Boulevard.

Figure 4. Partial Cover Lowered Alternative



Alternative Options

Expansion Options. Expansion Options, shown in Figure 2 and Figure 3, refer to moving the north edge of the highway north or the south edge of the highway south of the existing facility from Brighton Boulevard to Colorado Boulevard to accommodate the larger footprint resulting from standard width lanes, expanded shoulders, and construction phasing. These options apply to the No-Action Alternative and the Revised Viaduct Alternative. The Partial Cover Lowered Alternative does not include the Expansion Options because expansion of the highway can occur only on the north side due to engineering restrictions and the location of the UPRR rail yard to the south.

Connectivity Options. Connectivity Options are shown in Figure 4 and apply only to the Partial Cover Lowered Alternative. They include different frontage road and highway cover combinations. The Basic Option includes a highway cover between Clayton Street and Columbine Street, with 46th Avenue operating as a one-way road on each side of the highway (westbound on the north side and eastbound on the south side). The Modified Option removes the Steele Street/Vasquez Boulevard interchange to include an additional cover in the vicinity of Steele Street. 46th Avenue is designed as a two-way street on both the north and south sides of the highway; however, it is discontinued between Clayton Street and Columbine Street on the north side to allow for a seamless connection between Swansea Elementary School and the cover. Vehicular north/south connectivity across the highway at Josephine Street will be eliminated and replaced with a bike/pedestrian bridge. Additional connectivity and intersection improvements are discussed in Chapter 3, Summary of Project Alternatives, in the Supplemental Draft EIS.

Operational Options. Operational Options include two scenarios on how the additional capacity will be managed and operated. The General-Purpose Lanes Option will allow all vehicles to use all the lanes on the highway, while the Managed Lanes Option implements operational strategies (such as pricing) for the additional lanes that would be adjusted based on real-time traffic demand for vehicles that use these lanes. The additional lanes are separated with a four-foot buffer from the rest of the lanes under the Managed Lanes Option, and they have direct connections to I-225, I-270, and Peña Boulevard. Operational Options apply to the Revised Viaduct Alternative and the Partial Cover Lowered Alternative, and they are shown in Figure 3 and Figure 4.

6. Effects analysis

This section analyzes potential environmental consequences that would result from the loss of wetland habitat from the project alternatives. As stated in the existing conditions section, the wetlands present in the project area were identified in the field. This determination of effects is based on conceptual design and is subject to change.

6.1. Methodology

Impacts can occur directly or indirectly and be temporary or permanent. Direct impacts are the result of the physical destruction or degradation of a resource within a proposed project alternative. An example of a direct impact is the excavation and grading of wetland habitat during road construction. Indirect impacts are foreseeable effects that are somewhat distant from the project in time and/or space (see 40 CFR §1508.8). A relatively common example of an indirect impact is the introduction and establishment of noxious weeds on newly disturbed soils. The noxious weeds become established and begin to out-compete native plant species, eventually leading to the degradation of wetland habitats.

Temporary impacts are short-term and are usually restored to pre-impact functionality within five years. When not permanent, impacts to emergent wetlands are often considered short-term because these communities recover more quickly than plant communities possessing a woody plant component.

Permanent impacts are those impacts where a complete change in functionality occurs (i.e., land conversion) and persist for the lifetime of the facility. Permanent effects result from construction activities, specifically placement of bridge piers, fill, and new roadway. Temporary effects include those that temporarily alter the function of waters of the U.S. due to modification or disturbance during construction. These effects result from vegetation removal, soil exposure, and construction activities taking place in or adjacent to wetlands. These effects can be mitigated and returned to their pre-construction condition after conclusion of construction activities, if proper management is applied.

Projected impacts to waters of the U.S. were calculated by overlaying the construction footprint over the wetland polygons in a GIS environment. Permanent impacts were assumed to occur where the overlap occurs between the construction footprint and the wetland polygons unless additional information about the projected impacts was available. Such specifics were available for the design or in-construction techniques for the proposed outfalls on the South Platte River and for the proposed on and off ramp bridges over Sand Creek, but were not available for other locations. Temporary impacts also were calculated, where appropriate, by using a 10-foot offset from the projected construction limits.

6.2. Effects of alternatives

As described previously in Section 5, Description of Alternatives, the Supplemental Draft EIS evaluates one No-Action Alternative and two Build Alternatives. This section describes the potential effects on wetlands and other waters of the U.S. from these alternatives.

6.2.1. No-Action Alternative

The No-Action Alternative would have no impacts to wetlands. However, construction of the onsite storm drain outfall north of I-70 would result in impacts to other waters of the U.S. The storm drain outfall would traverse the Burlington Ditch/O'Brien Canal and discharge into the South Platte River. Construction of the outfall would result in approximately 0.001 acre of temporary impact to the South Platte River channel.

6.2.2. Build Alternatives

The Build Alternatives permanently impact wetlands and other waters of the U.S. Roughly 4.111 acres of direct, permanent impact to wetlands would occur under the Build Alternatives. Of this total, an estimated 0.001 acre of jurisdictional wetland along Sand Creek would be impacted, with the remaining 4.110 acres of permanent impact occurring to non-jurisdictional roadside ditch and stormwater detention pond wetlands (see Table 4 and Table 5); note that only wetlands or water bodies impacted by the proposed project are shown in the tables).

Temporary impacts to wetlands also would occur. Approximately 0.1 acre of temporary impact to jurisdictional wetlands is projected to occur under all Build Alternatives. Roughly 0.195 acre of temporary impact would occur to non-jurisdictional wetlands under the Build Alternatives.

Construction of the Build Alternatives would result in impacts to Sand Creek and the South Platte River. Both of the Build Alternatives are anticipated to impact the Sand Creek channel by a total of 0.0001 acre permanently and 1.194 acres temporarily. The permanent impact would be caused by the installation of a bridge pier. At the South Platte River, impacts in the river channel would occur from storm drain construction north and south of I-70. As with the No-Action Alternative, both Build Alternatives would cause approximately 0.001 acre of temporary impact to the South Platte River channel as a result of the onsite outfall system construction. With the Partial Cover Lowered Alternative, an additional 0.012 acre of permanent impact to the South Platte River channel would result from construction of an offsite outfall system south of I-70 (see Table 5) note that only water bodies impacted by the proposed project are shown in the table).

Table 4. Impacts to wetlands in the study area¹

Jurisdictional or	Facture	Build Altern	natives
Non-Jurisdictional	Feature	Perm.	Temp.
Lordo Portonol	WET278-09	0.001	0.066
Jurisdictional (Sand Creek and Fringe)	WET278-10	_	0.005
	WET278-11	_	0.014
	WET278-12	_	0.015
Jurisdictional Total		0.001	0.100
	WET279-01	1.053	0.095
	WET280-01	0.005	0.012
Non-Jurisdictional (Stormwater basins)	WET280-02	0.008	0.012
(Otomiwator sasins)	WET280-04	0.236	
	WET281-07	0.094	0.068
Non-Jurisdictional (Stormwater basins)	WET282-01	2.609	
	WET280-05	0.001	0.005
	WET280-08	0.012	_
	WET281-01	0.024	_
	WET281-02	0.004	
Non-Jurisdictional	WET281-03	0.022	
(Roadside ditches)	WET281-04	0.008	
	WET281-05	0.024	_
	WET281-06	0.010	0.003
	WET284-01	_	_
	WET285-02	_	_
Non-Jurisdictional Total (wetlands only)		4.110	0.195
Total Wetland Impacts (jurisdictional and non-jurisdictional)		4.111	0.295

Note: Impacts were calculated based on conceptual design as of March 2013 and are subject to change.

¹The No-Action Alternative has no wetland impacts; therefore, this table only reflects the Build Alternatives and associated options.

Table 5. Impacts¹ to other waters of the U.S. in the study area (all jurisdictional)

Waterbody	Feature ID	No-Ad Altern (acr	ative	Revised Viaduct Alternative (acres)		Partial Cover Lowered Alternative (acres)	
		Perm.	Temp.	Perm.	Temp.	Perm.	Temp.
South Platte River	OW-N_Culv	_	0.001	_	0.001	_	0.001
	OW-S_Culv	_	_	_		0.012	_
Sand Creek	OW278-01	_	_	0.0001	1.194	0.0001	1.194
Total Other Waters of the U.S. Impacts		_	0.001	0.0001	1.195	0.012	1.195

Note: Impacts were calculated based on conceptual design and are subject to change.

6.3. Permitting

In the event that either Build Alternative is selected, roughly 0.001 to 0.0 acre of jurisdictional waters of the U.S. would be permanently impacted. USACE would be consulted on the appropriate permit, but this type of activity often is permitted under Nationwide Permit 14—Linear Transportation Projects. In addition, Senate Bill 40 certification from Colorado Parks and Wildlife and completion of an internal Wetland Finding also would be required. CDOT would complete the Senate Bill 40 certification, complete the Wetland Finding, and obtain a permit from the USACE prior to commencing work.

6.4. NEPA/Section 404 coordination

CDOT is currently coordinating with USACE to fulfill the requirements of the NEPA/CWA merger process.

7. Mitigation

Per CDOT guidelines, all permanently impacted wetlands, both jurisdictional and non-jurisdictional, would be replaced at a 1:1 ratio. At this time, it is planned that unavoidable impacts would be mitigated at a wetland mitigation bank in the South Platte River watershed. In addition, the following mitigation measures would be implemented during and after construction of a preferred alternative to avoid or minimize effects to wetlands and other waters of the U.S.:

- Temporary erosion control and sediment control best management practices (BMPs) will be installed prior to ground disturbance activities. Completed areas will be permanently stabilized within seven days. The following BMPs are proposed:
 - Unnecessary temporary effects would be avoided by fencing the limits of disturbance during construction.
 - No equipment staging or storage of construction materials will occur within 50 feet of wetlands.
 - The use of chemicals—such as soil stabilizers, dust inhibitors, and fertilizers—within 50 feet of wetlands will be prohibited.
 - o Temporary fill material will not be stored within wetlands.
 - No discharge of effluent into wetlands will occur.

¹Impact totals are applicable to all options associated with the No-Action and Build Alternatives.

- All areas of exposed soil will be seeded and/or planted, and mulched throughout construction (following completion of each section). Mulch and mulch tackifier will be placed for temporary erosion control when seeding and/or planting cannot occur due to seasonal constraints.
- o If any wetland areas are used for construction access, they will be covered with a layer of geotextile, straw, and soil prior to use.
- o Wetlands temporarily affected during construction will be restored to pre-construction conditions.

All contractors would be required to consider methods, where feasible, to limit the effects of construction to water resources, including the following:

- Install perimeter erosion control measures prior to grading.
- Implement stabilization BMPs, such as mulching, temporary seeding, and erosion control blankets.
- Wash concrete trucks in designated concrete washout areas at least 50 feet away from surface water sources.
- Build stabilized construction entrances to the site to limit mud and dirt deposition on local roadways.
- Use erosion prevention measures to prevent the need for extensive erosion control (measures such as staging the construction to reduce disturbance, minimizing access areas, temporary seeding, early final grading and seeding of completed areas, and clean water diversions). Permanent water quality ponds can be constructed early and used for construction runoff.
- Roughen disturbed surfaces throughout construction.
- Use temporary sediment control features, such as silt fence, erosion logs, and erosion bales.
- Place permanent native seeding incrementally throughout project.
- Place temporary stabilization (mulch and mulch tackifier, soil binder) when native seeding is not allowed due to seasonal constraints.
- Comply with local and federal permitting requirements for construction within floodplains.
- Limit the size of construction areas.
- Apply geotextile fabric before construction of temporary crane pads.
- Use rubber tire construction equipment, when feasible.
- When necessary, set up gravel barriers around work area when installing piers or working within the South Platte River or Sand Creek to divert water flow and prevent sediment in the channel.
- Install perimeter sediment control devices, such as erosion bales and/or silt fencing.
- Follow the spill prevention and containment procedures outlined in the spill prevention plan included within the construction stormwater management plan.
- Inspect erosion and sediment control measures at least every 14 days and after precipitation events that cause surface erosion.
- Avoid ground-disturbing activities or work near streams during heavy precipitation events.
- Till soils that have been compacted by heavy construction equipment to allow for quicker establishment of vegetation.
- Sequence ground clearing so the entire site is not disturbed at once; stabilization of a cleared site should occur as soon as construction activity is completed.
- Temporarily seed or mulch areas that will not be regraded within seven days.
- Use central staging areas for all equipment and disposal of waste material; these staging areas should not be located within 50 feet of streams, wetlands, or sensitive habitat areas.

- Manage waste stockpiles of concrete, solids, sanitary/septic materials, liquids, and hazardous materials through implementation of waste management BMPs.
- Locate temporary sanitation facilities no less than 50 feet from waterways to reduce the effect of potential releases.
- Use a vacuum sweeper immediately to sweep cutting dust after concrete cutting operations.
- Construct and use stabilized construction entrances/exits to reduce mud and dirt deposition on local roadways.
- Construct temporary water quality basins where right of way allows.
- Use certified weed free mulch and hay bales in accordance with the Colorado Noxious Weed Act (CRS 35-5.5).
- Reseed disturbed areas with a native grass mix that also includes forbs and shrubs. The seed mix will
 include oats (*Avena sativa*) that will be applied at a low rate to facilitate soil stabilization while native
 species are establishing.
- Stabilize all slopes steeper than 3:1 with erosion control blankets.
- Construct near major streams during the drier months, from October to February. Based on hydrograph data collected by the WRCC, Denver receives less than 1 inch of precipitation during these months.
- Follow the sanding and sweeping requirements of Colorado Department of Public Health and Environment, Regulation Number 16, vacuum sweepers will be used to remove sand remaining after a sanding event.

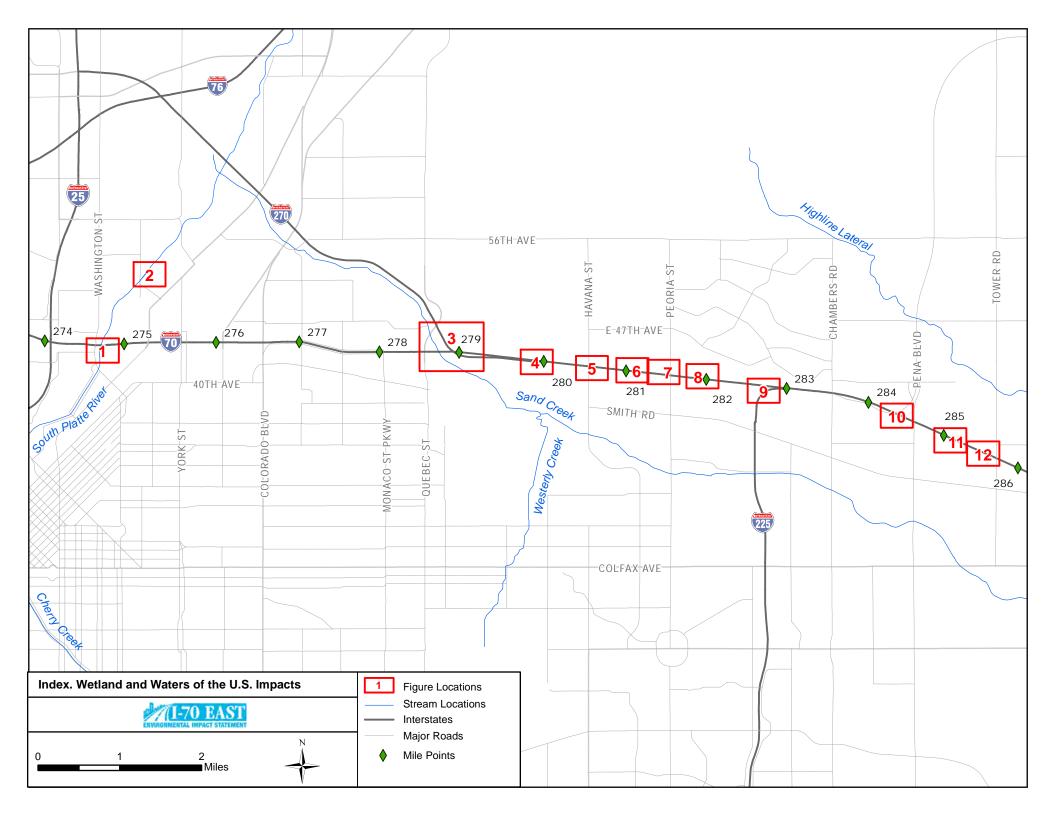
8. References

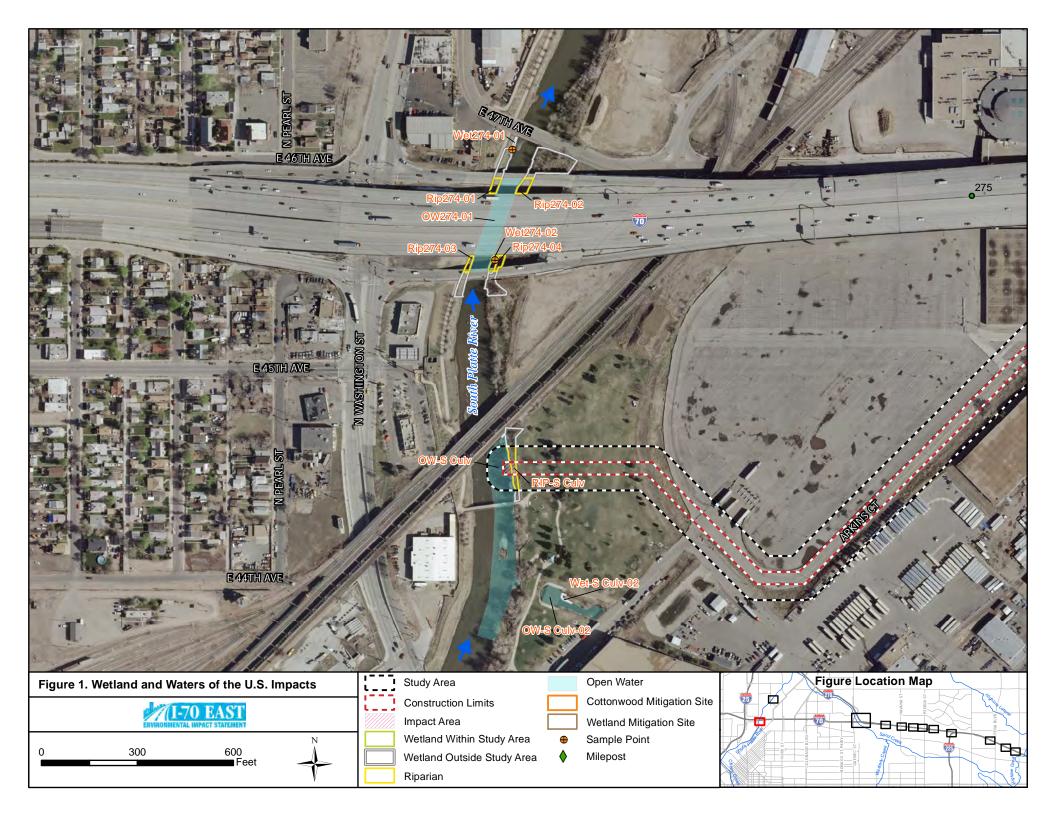
- Carter, J. (1977, May 24). Protection of wetlands. Exec. Order No. 11990.
- Cowardin, L.M, Carter, V., Golet, F.C., & LaRoe, E. (1979). Classification of wetlands and deepwater habitats of the United States. FWS/OBS-79/31. Washington, D.C.: U.S. Fish and Wildlife Service.
- Department of Transportation (August 24, 1978). DOT 5660.1A—Preservation of the nation's wetlands. Washington, D.C.: Author.
- Environmental Laboratory. (1987). Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1 (online edition). Vicksburg, MS: USACE Waterways Experiment Station.
- Environmental Technologies Action Plan. (2001). FHWA guidance on SWANCC decision advises staying the course, but application of Executive Order 11990 may be affected. February 14th. ETAP—A program of AASHTO's Standing Committee on the Environment. Washington, D.C.
- Lichvar, R.W. (2012). The National Wetland Plant List. ERDC/CRREL TR-12-11. Hanover, NH. U.S. Army Engineer Research and Development Center. p. 224.
- Natural Resources Conservation Service. (2010). *Field Indicators of Hydric Soils in the United States*, Version 7.0. L.M. Vasilas, G.W. Hurt, and C.V. Noble (eds.). USDA, NRCS, in cooperation with the National Technical Committee for Hydric Soils. p. 44.
- Natural Resources Conservation Service. (2012). Web Soil Survey. Retrieved. . November 1, 2012, from http://websoilsurvey.nrcs.usda.gov/.
- Sipple, W. S. (2005) U.S. Environmental Protection Agency Office of Water. EPA wetland functions and values module. Retrieved August 18, 2005, from http://www.epa.gov/watertrain/wetlands/index.htm
- Smith, R.D., A. Ammann, C. Bartoldus, & M.M. Brinson. (1995). An approach for assessing wetland functions using hydrogeomorphic classification, reference wetlands, and functional indices. Wetland Research Program Technical Report WRP-DE-9. Vicksburg, MS: U.S. Army Corps of Engineers Waterways Experiment Station.
- U.S. Army Corps of Engineers. (1999). Definition of Waters of the United States, §404(a) of the Clean Water Act, 33 USC §1344(a), 33 CFR § 328.
- U.S. Army Corps of Engineers. (2010). Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0), ed. J. S. Wakeley, R. W. Lichvar, and C. V. Noble. ERDC/EL TR 10-1. Vicksburg, MS: U.S. Army Engineer Research and Development Center.
- U.S. Department of Agriculture. (1994). Changes in hydric soils of the United States. *Federal Register*, 59 (133).
- U.S. Department of Defense, Department of the Army, Corp of Engineers. (2006). Proposal to reissue and modify nationwide permits. *Federal Register*, 71 (186).
- U.S. Environmental Protection Agency and U.S. Army Corps of Engineers. (2007a). Clean Water Act Jurisdiction following the U.S. Supreme Court's decision in *Rapanos v. United States & Carabell v. United States*. Issued June 5, 2007. Washington, D.C.
- U.S. Environmental Protection Agency and U.S. Army Corps of Engineers (EPA and COE). (2007b).

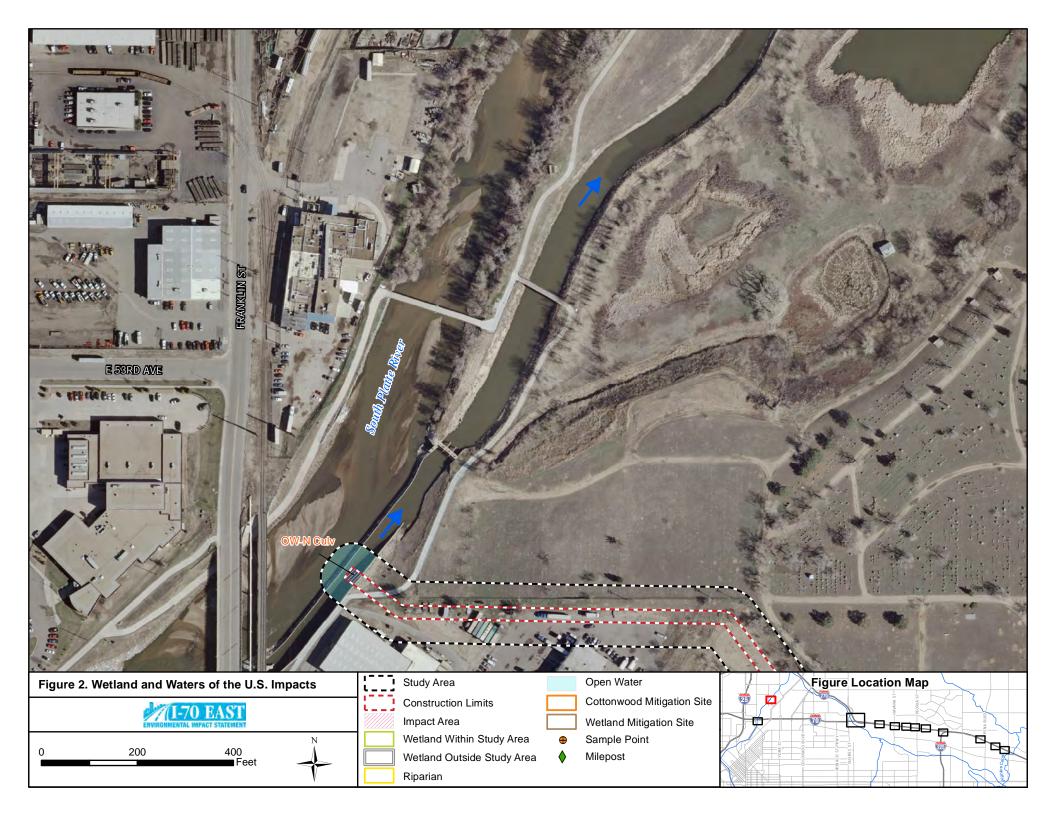
 Memorandum for Director of Civil Works and U.S. EPA Regional Administrators. Washington, D.C.

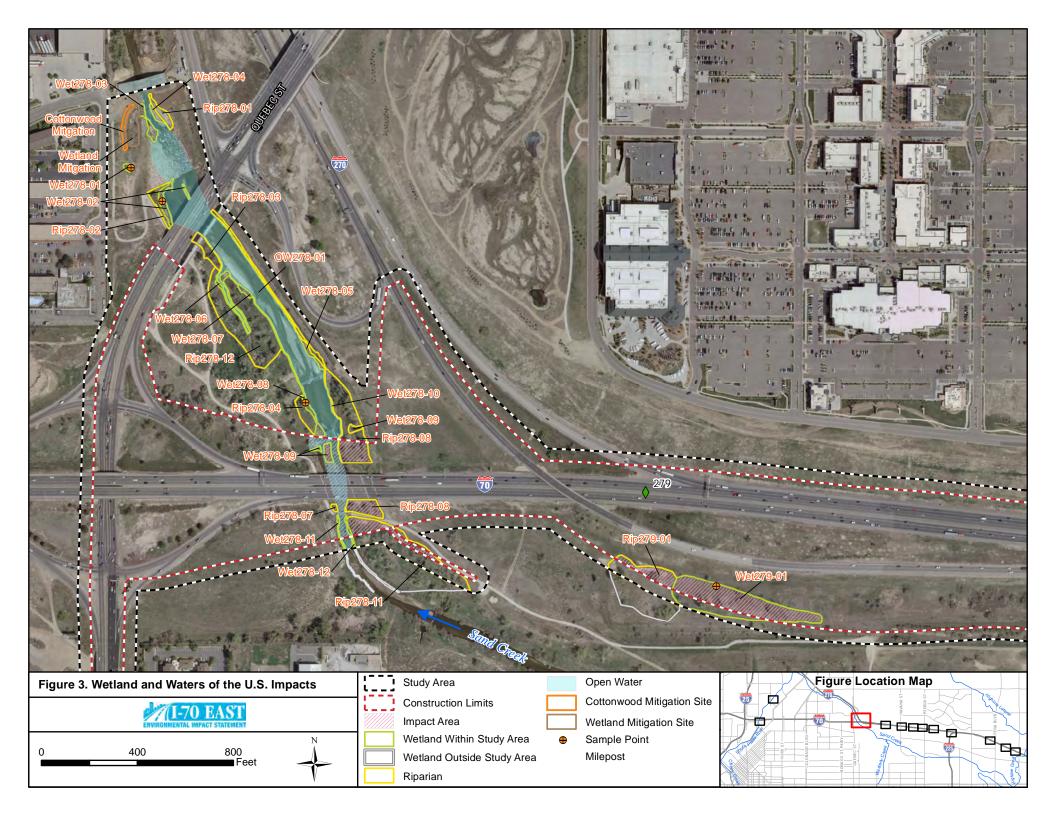
- U.S. Fish and Wildlife Service. (1991a). National Wetlands Inventory, Commerce City, Colorado 7.5-minute quadrangle. Fish and Wildlife Service, National Wetlands Inventory.
- U.S. Fish and Wildlife Service. (1991b). National Wetlands Inventory, Sable, Colorado 7.5-minute quadrangle. Fish and Wildlife Service, National Wetlands Inventory.
- U.S. Fish and Wildlife Service. (1997). National Wetlands Inventory, Box Elder School, Colorado 7.5-minute quadrangle. Fish and Wildlife Service, National Wetlands Inventory.
- Western Regional Climate Center. (2012). Climate summary for Denver WSFO AP, CO (Coop 052220-4). Period of record 8/1/1948 through 7/31/2012. Retrieved November 1, 2012, from http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?co2220.

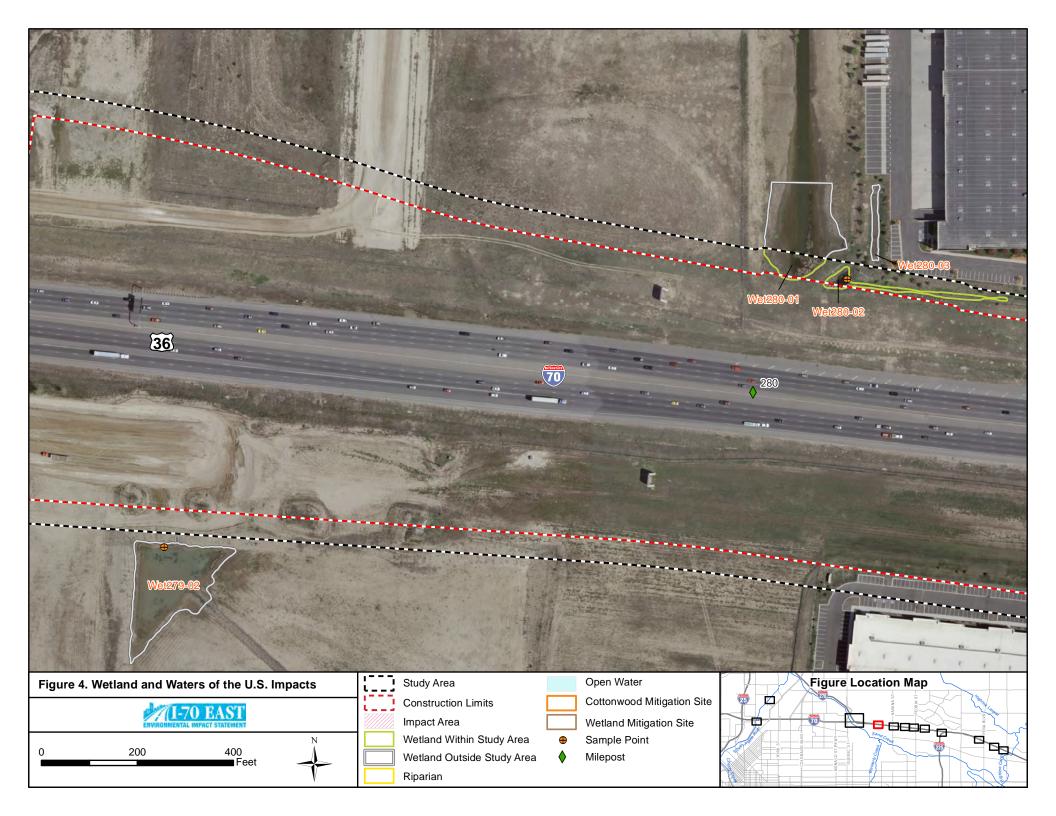
Attachment N – Appendix A Figures

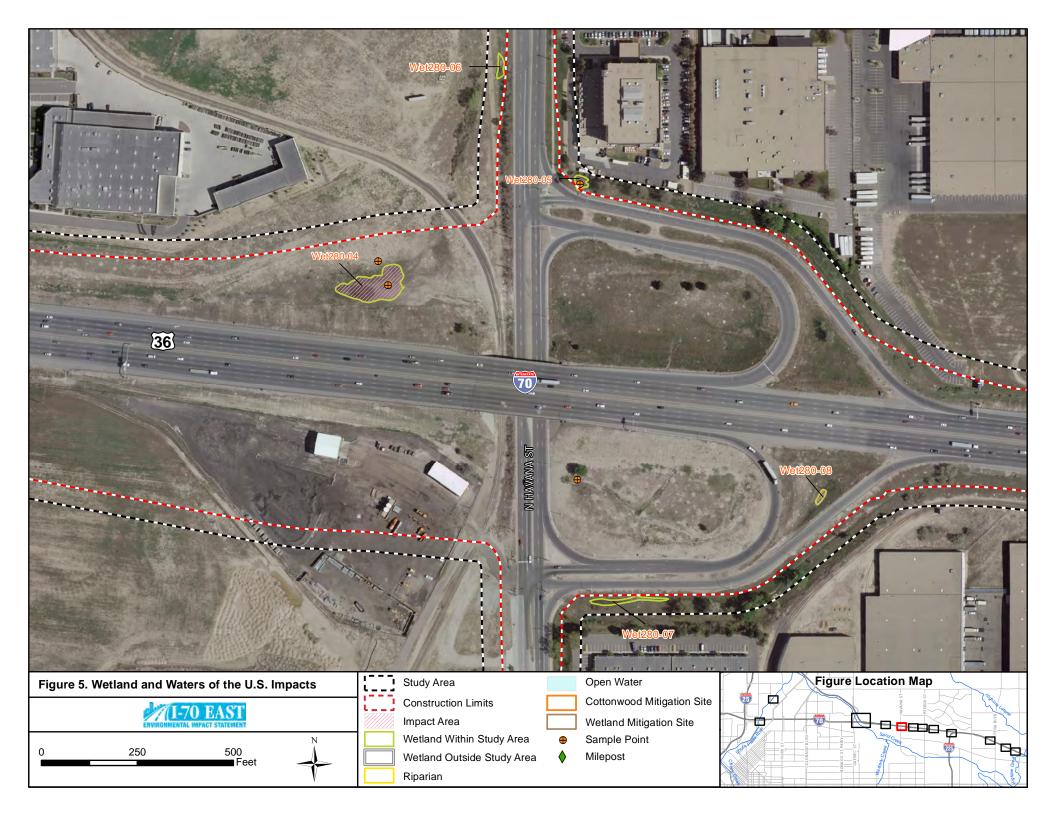


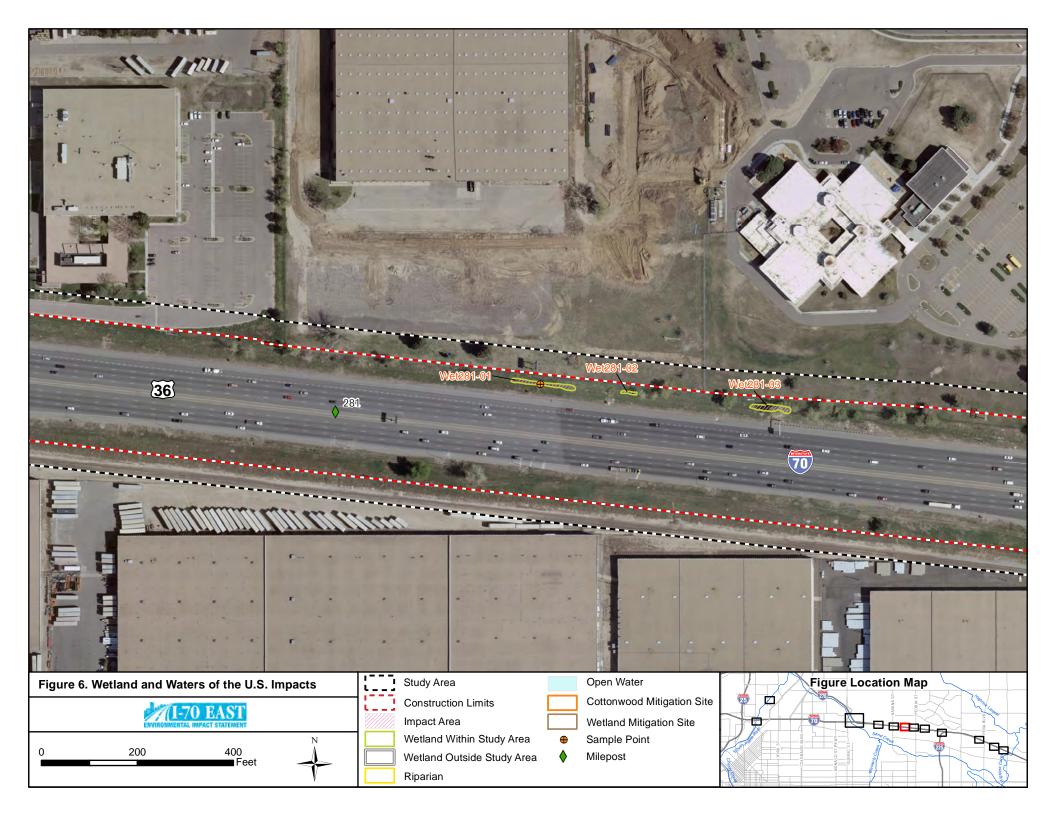


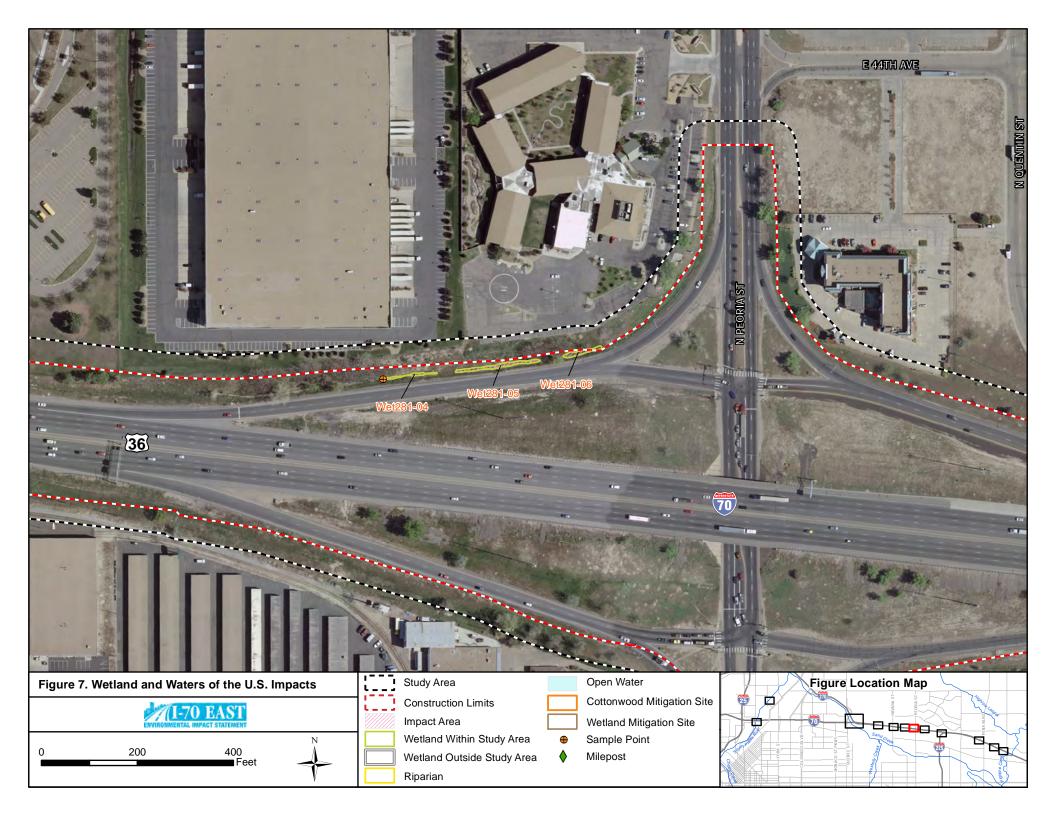


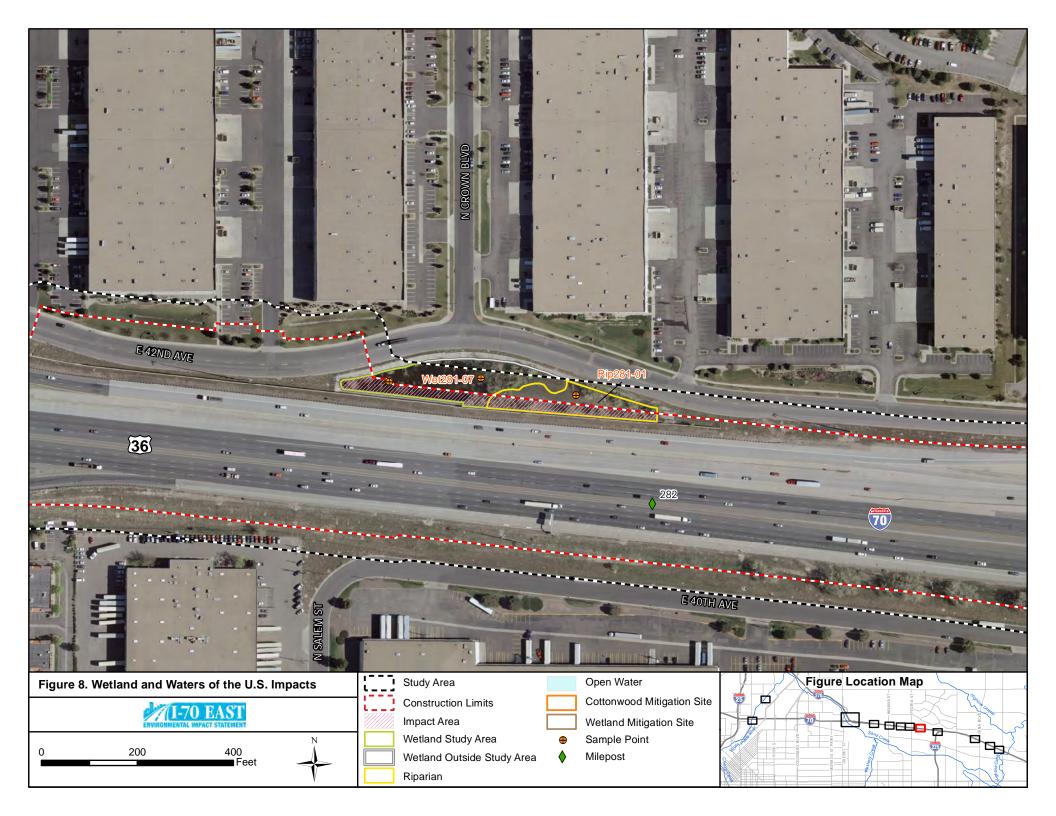


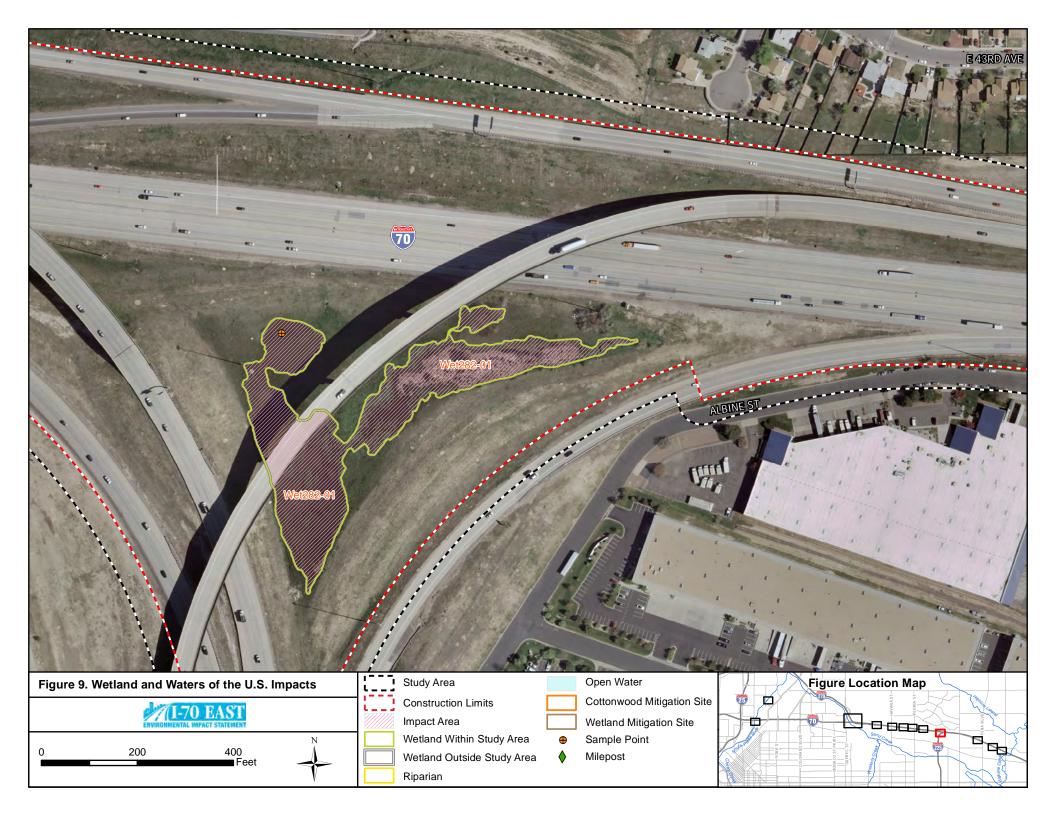


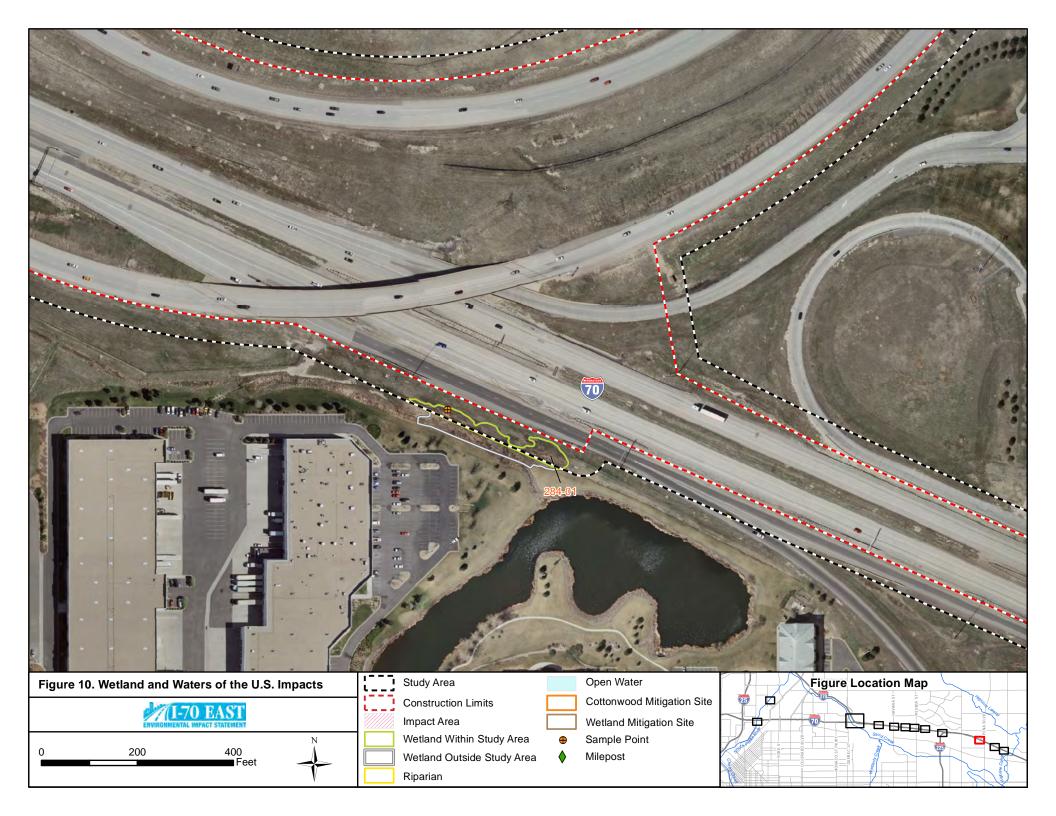


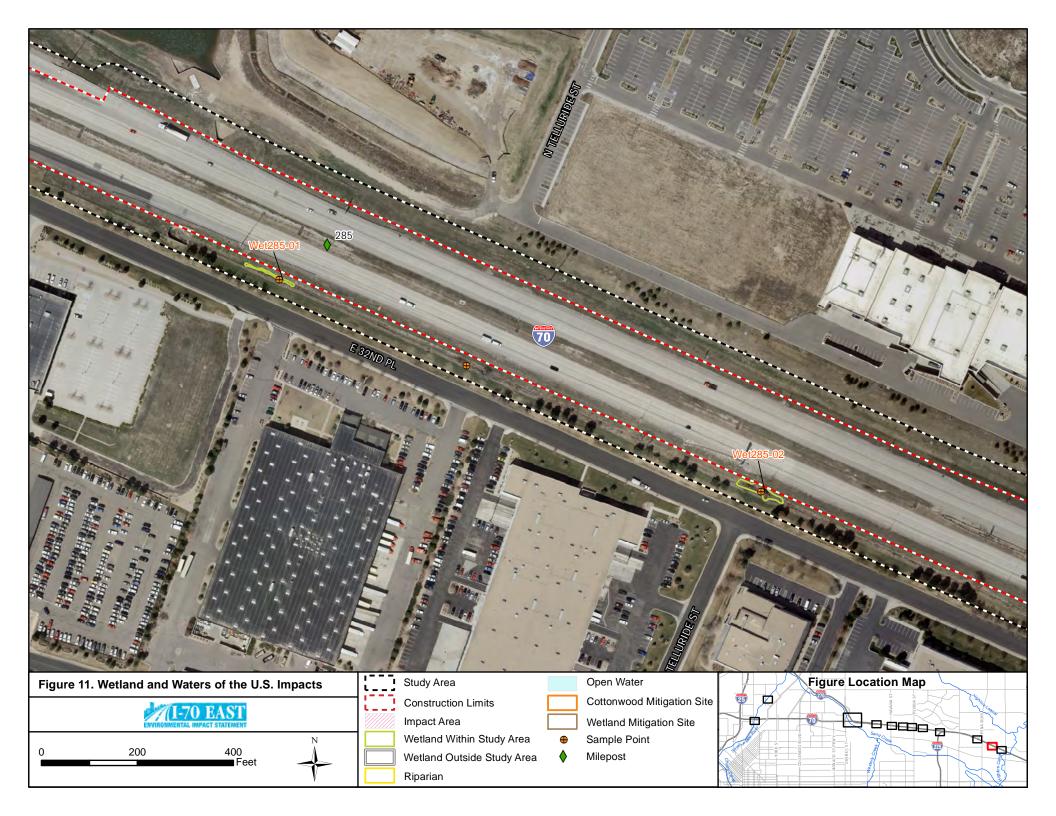


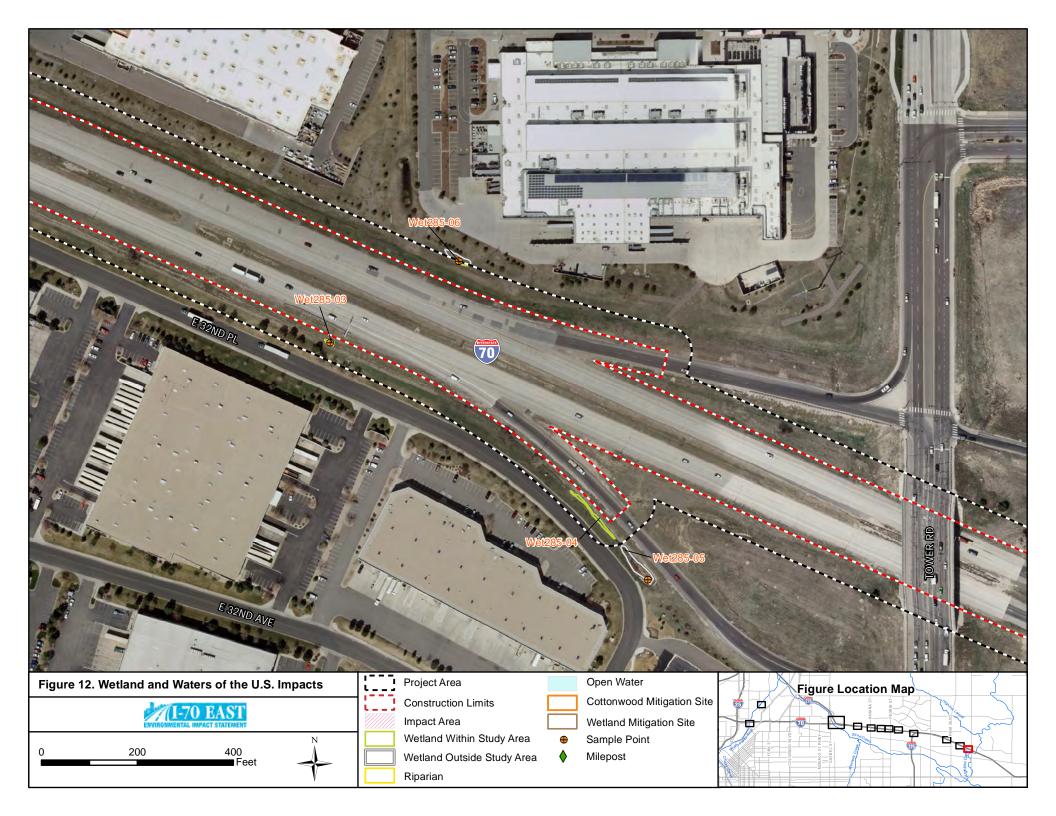












Attachment N – Appendix B Photographs



Photo 1. Wetland WET274-01 – South Platte River wetland fringe on left bank north of I-70.



Photo 2. Wetland WET274-02 – South Platte River wetland fringe on right bank south of I-70.



Photo 3. Wetland WET278-01 – Stormwater basin near Sand Creek.



Photo 4. Wetland WET278-02 – Sand Creek wetland fringe on left bank downstream of Quincy Avenue Bridge.



Photo 5. Wetland WET278-03 – Sand Creek wetland fringe on left bank, facing downstream (north)



Photo 6. Wetland WET278-04 wetland fringe on right bank, facing upstream (south)



Photo 7. Wetland WET278-05 – Sand Creek wetland fringe on right bank upstream (south) of pedestrian bridge.



Photo 8. Wetland WET278-06 – Sand Creek wetland fringe in side channel, facing downstream.



Photo 9. Wetland WET278-07 – Sand Creek wetland fringe on left bank, facing downstream (north).



Photo 10. Wetland WET278-08 – Sand Creek wetland fringe facing downstream.



Photo 11. Wetland WET278-09 – Sand Creek downstream of I-70, facing east.



Photo 12. Wetland WET278-10 (approx. center of photo in sunlight adjacent to creek). Sand Creek wetland fringe on right bank, facing downstream.



Photo 13. Wetland WET278-11. Sand Creek wetland fringe on left bank south of I-70. Facing upstream from pedestrian bridge.



Photo 14. Wetland WET278-12. Sand Creek wetland fringe



Photo 15. Wetland WET279-01 - Stormwater basin



Photo 16. Wetland WET279-02 – Stormwater basin



Photo 17. Wetland WET280-01 – Stormwater basin



Photo 18. Wetland WET280-02 – Stormwater basin



Photo 19. Wetland WET280-03 – Stormwater basin



Photo 20. Wetland WET280-04 – Stormwater basin



Photo 21. Wetland WET280-05 – Roadside ditch



Photo 22. Wetland WET280-06 - Roadside ditch



Photo 23. Wetland WET280-07 – Roadside ditch



Photo 24. Wetland WET280-08 - Roadside ditch



Photo 25. Wetland WET281-01 – Roadside ditch Photo 26. Wetland WET281-02 – Roadside ditch





Photo 27. Wetland WET281-03 – Roadside ditch



Photo 28. Wetland WET281-04 – Roadside ditch





Photo 27. Wetland WET281-05 – Roadside ditch Photo 30. Wetland WET281-06 – Roadside ditch



Photo 31. Wetland WET281-07 – Stormwater basin



Photo 32. Wetland WET282-01 - Stormwater basin. Sample point.



Photo 33. Wetland WET282-01. Stormwater basin. Near the east end facing west.



Photo 34. Wetland WET284-01 – Roadside ditch



Photo 35. Wetland WET285-01 – Roadside ditch



Photo 36. Wetland WET285-02 - Roadside ditch



Photo 37. Wetland WET285-03 – Roadside ditch Photo 38. Wetland WET285-04 – Roadside ditch





Photo 39. Wetland WET285-05 – Roadside ditch **Photo 40.** Wetland WET285-06 – Roadside ditch



Attachment N – Appendix C Wetland Data Forms

Project/Site: I-70 East DEIS/ South outfall			unty: _	Denver		Sampling Date: <u>11/18/2013</u>
		State: CO				
Investigator(s): Joe Allison, Karin McShea		Section,	, Towr	nship, Rar	nge: Sec22 ,T3S, R68W	
Landform (hillslope, terrace, etc.): terrace		Local re	elief (c	concave, c	convex, none): none	Slope (%): 0
Subregion (LRR): G-Western Great Plains and Irrigated Region	on Lat: 39.7	776372			Long: 104.976960	Datum: NAD83
Soil Map Unit Name: Soils have not been mapped in this are						ation: N/A
Are climatic / hydrologic conditions on the site typical for thi						
Are Vegetation, Soil, or Hydrology						resent? Yes X No
Are Vegetation, Soil, or Hydrology					eded, explain any answer	
SUMMARY OF FINDINGS – Attach site map						
Hydrophytic Vegetation Present? Yes X N	10		- 41	C ll	A	
Hydric Soil Present? Yes X N	lo			Sampled a Wetlan		No
Wetland Hydrology Present? Yes x N	lo		771611111	a wettan	165	
Remarks: Severe flooding in previous month. VEGETATION – Use scientific names of plan	nts.					
Table 1 and the second	Absolute	Domin	nant Ir	ndicator	Dominance Test works	sheet:
Tree Stratum (Plot size: 30 Ft radius)	% Cover	Specie	es?	Status	Number of Dominant Sp	pecies
1					That Are OBL, FACW, of (excluding FAC-):	or FAC (A)
2					,	
3					Total Number of Domina Species Across All Strat	4
4	0	= Total	Cove			
Sapling/Shrub Stratum (Plot size: 15 Ft radius) 1)					Percent of Dominant Sp That Are OBL, FACW, o	
2.					Prevalence Index work	
3					Total % Cover of:	
4						x 1 = 0 x 2 = 200
5						$x = \frac{0}{0}$
Herb Stratum (Plot size: 5 Ft radius	0	= Total	Cove	r	EAGUL	0
1. Typha latifolia	100	Υ	(OBL	UPL species	x 5 = 0
2.					Column Totals: 100	
3.					D I I I	D/A 2
4					Prevalence Index Hydrophytic Vegetation	<u> </u>
5					X 1 - Rapid Test for H	
6					X 2 - Dominance Test	nts are FACW and/or OBL.
7					X 3 - Prevalence Inde	
8						daptations ¹ (Provide supporting
9						s or on a separate sheet)
10	400	= Total	Cove		Problematic Hydrop	ohytic Vegetation ¹ (Explain)
Woody Vine Stratum (Plot size: 15 Ft radius) 1		rotar	00101		¹ Indicators of hydric soil be present, unless distu	and wetland hydrology must irbed or problematic.
2.					Hydrophytic	
		= Total	Cove	r	Vegetation	a X No
% Bare Ground in Herb Stratum 0	100	= Total	Veg C	Cover	Present? Yes	s <u>x</u> No
Remarks:	D5 - FAC Neut	tral Test for h	hydrology.	. Drop all FAC,	cross examine all other dominants. If > 5	0% remaining are FACW to OBL, then YES to D5.

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SOIL Sampling Point: SP5

Profile Desc	cription: (Describ	e to the depth	needed to docur	nent the i	indicator	or confirn	n the absence	of indicators.)
Depth	Matrix			x Feature		. ?		.
(inches)	Color (moist)		Color (moist)	%	Type ¹	Loc ²	<u>Texture</u>	Remarks
0-12	10 YR 3/2						Sand	
12-18	10 YR 2/1						Sandy clay loam	Extremely Dark in color
	-							
				-				
	-							
¹Type: C=C	oncentration D=D	enletion RM=R	Reduced Matrix, CS	S=Covered	d or Coate	nd Sand G	rains ² l or	cation: PL=Pore Lining, M=Matrix.
			RRs, unless othe			d Sand O		for Problematic Hydric Soils ³ :
Histosol			Sandy (Muck (A9) (LRR I, J)
	oipedon (A2)			Redox (S5				Prairie Redox (A16) (LRR F, G, H)
Black Hi				d Matrix (S				Surface (S7) (LRR G)
X Hydroge	en Sulfide (A4)			Mucky Mir				Plains Depressions (F16)
Stratified	d Layers (A5) (LR	R F)	Loamy	Gleyed Ma	atrix (F2)		(LR	RR H outside of MLRA 72 & 73)
<u>X</u> 1 cm Ми	ıck (A9) (LRR F, C	∋, H)	Deplete	d Matrix (F3)			ed Vertic (F18)
	d Below Dark Surf	ace (A11)		Dark Surfa				arent Material (TF2)
	ark Surface (A12)				ırface (F7))		Shallow Dark Surface (TF12)
	/lucky Mineral (S1 //ucky Peat or Pea			Depressio	ns (F8) essions (F	16)		(Explain in Remarks) of hydrophytic vegetation and
	icky Peat or Peat				73 of LRR			d hydrology must be present,
0 0111 1/10	loky i cat of i cat	(OO) (LITTI)	(1012	10.720	O OI LIKI	11)		disturbed or problematic.
Restrictive I	Layer (if present)	:						P
Type:								
, , <u> </u>	ches):						Hydric Soil	Present? Yes x No No
Remarks:	,							
HYDROLO	GY							
Wetland Hy	drology Indicator	s:						
Primary India	cators (minimum c	f one required;	check all that appl	y)			Seconda	ary Indicators (minimum of two required)
Surface	Water (A1)		Salt Crust	(B11)			Surf	face Soil Cracks (B6)
X High Wa	ater Table (A2)		Aquatic In	vertebrate	es (B13)		Spa	rsely Vegetated Concave Surface (B8)
X Saturation	on (A3)		X Hydrogen	Sulfide O	dor (C1)		Drai	inage Patterns (B10)
Water M	larks (B1)		Dry-Seaso	n Water 1	Γable (C2)		Oxid	dized Rhizospheres on Living Roots (C3)
Sedimer	nt Deposits (B2)		Oxidized F	Rhizosphe	res on Liv	ing Roots	(C3) (w	vhere tilled)
Drift Dep	posits (B3)		(where i	not tilled)			Cra	yfish Burrows (C8)
Algal Ma	at or Crust (B4)		Presence	of Reduce	ed Iron (C4	1)	Sati	uration Visible on Aerial Imagery (C9)
Iron Dep	oosits (B5)		Thin Muck	Surface ((C7)		Geo	omorphic Position (D2)
Inundati	on Visible on Aeria	al Imagery (B7)	Other (Exp	olain in Re	emarks)		FAC	C-Neutral Test (D5)
Water-S	tained Leaves (B9	9)					Fros	st-Heave Hummocks (D7) (LRR F)
Field Obser	vations:							
Surface Wat	er Present?		Depth (in			_		
Water Table	Present?	Yes X No	Depth (in	ches): <u>11</u>				
Saturation P (includes car	oillary fringe)		Depth (in					y Present? Yes x No No
Describe Re	corded Data (strea	am gauge, mon	itoring well, aerial	photos, pr	evious ins	pections),	if available:	
Remarks:								
1								

Project/Site: I - 70 EAST	City/County:	NVFR Sampling Date: 9/2/20
Applicant/Owner: CDOT		State: Sampling Point: Z74- C
Investigator(s): ATKINS (MCEUDI)	WEIL Section, Township, F	Range: <u>\$23, 735, R68W</u>
Landform (hillslope, terrace, etc.): BENCH		e, convex, none): NONE Slope (%): </td
Subregion (LRR): LRR G		Long: _104. 97758721 Datum: WGS &
Soil Map Unit Name: Not AVAILABLE		NWI classification: NONE
Are climatic / hydrologic conditions on the site typical for		
Are Vegetation, Soil, or Hydrology		e "Normal Circumstances" present? Yes No
Are Vegetation, Soil, or Hydrology		needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach site ma	ip snowing sampling point	locations, transects, important features, etc.
	No Is the Sample	ed Area
		and? Yes No
	No	
Remarks: S. PLATTE RIVER, N.O.	F I-70, WEST BA	NK, 4 Ft. WIDE FRINGE
ADJ. TO CHANNEL. PEM/7	255 RIVERIALE	,
00. 10.71	DI, FILLIAGE	
VEGETATION – Use scientific names of pl	ants.	
TOTAL SECTION OF ACCUSANCE OF THE PROPERTY OF	Absolute Dominant Indicator	
Tree Stratum (Plot size:)	% Cover Species? Status	Number of Dominant Species
		That Are OBL, FACW, or FAC (excluding FAC-): (A)
2		
3		Total Number of Dominant Species Across All Strata: (B)
**************************************	= Total Cover	- 1
Sapling/Shrub Stratum (Plot size:)		Percent of Dominant Species That Are OBL, FACW, or FAC:/_O(A/B)
1		Prevalence Index worksheet:
2		Total % Cover of: Multiply by:
3		OBL species x 1 =
4		FACW species x 2 =
5,	= Total Cover	FAC species x 3 =
Herb Stratum (Plot size: 3 Ft. DiA.)		FACU species x 4 =
1. CAREX LASIOCARPA	- 90 YES OBL	UPL species x 5 =
2. PHALARIS ARUNDINACEA	5 No FACU	Commence of the commence of th
3. CIRSIUM ARVENSE		Dravelence Index = D/A =
4. PERSICARIA SP.	_ ZI _NO OBL	Hydrophytic Vegetation Indicators:
5		1 - Rapid Test for Hydrophytic Vegetation
6		∠ 2 - Dominance Test is >50%
7 8.		3 - Prevalence Index is ≤3.0¹
9.		4 - Morphological Adaptations¹ (Provide supporting
10		data in Remarks or on a separate sheet) — Problematic Hydrophytic Vegetation¹ (Explain)
	160 = Total Cover	
Woody Vine Stratum (Plot size:)		Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1		Convenient Assenting Convenients Convenients and Assenting Convenients (1994) The Convenients of the Convenients (1994)
2	- Total Carres	Hydrophytic Vegetation
*Bare Ground in Herb Stratum Remarks: PEM/PSS FRINGE AND A EXIGUA OCCURS NORTH OF	= 10tal Cover	Present? Yes _ No
Remarks: DENN 1005 ENGLES NOTA	efact to Courted I	YATTE PINEN CALL
TENYTH THANKE HIS	CAMPIE DT	LATTICE ICIVERS, STUX
EXIGUA OCCURS NOTETH OF	soupe pi.	
S Army Corps of Engineers		Great Plains - Version 2.0

Profile Descri	ntion: (Describe	o the depth ne	eeded to document the indicato	r or confirm th	no absence of i	Sampling Point: 27	
	the same of the sa	o the depth ne		or committee	ie absence or i	iluicators.j	
Depth (inches)	Matrix Color (moist)	% C	Redox Features color (moist)	Loc2	Texture	Remarks	
(IIICIICO)	COICI (MOIOL)					TOTAL	
							_
							_
							_
¹Type: C=Con	centration, D=Depl	etion, RM=Redi	uced Matrix, CS=Covered or Coa	ted Sand Grain	s. ² Locatio	n: PL=Pore Lining, M=Matrix	8
			s, unless otherwise noted.)			Problematic Hydric Soils ³ :	
Histosol (A	1)		Sandy Gleyed Matrix (S4)		1 cm Muck	(A9) (LRR I, J)	
Histic Epip	edon (A2)		Sandy Redox (S5)		Coast Prai	rie Redox (A16) (LRR F, G, H)
Black Histi			Stripped Matrix (S6)		77	ce (S7) (LRR G)	
	Sulfide (A4)		Loamy Mucky Mineral (F1)			s Depressions (F16)	
	ayers (A5) (LRR F)		Loamy Gleyed Matrix (F2)			outside of MLRA 72 & 73)	
	(A9) (LRR F, G, H lelow Dark Surface		Depleted Matrix (F3) Redox Dark Surface (F6)		Reduced V	t Material (TF2)	
	Surface (A12)	(011)	Depleted Dark Surface (F7)	2		ow Dark Surface (TF12)	
	cky Mineral (S1)		Redox Depressions (F8)			lain in Remarks)	
	cky Peat or Peat (S	2) (LRR G, H)	High Plains Depressions (F16)	The second secon	ydrophytic vegetation and	
5 cm Muck	y Peat or Peat (S3)	(LRR F)	(MLRA 72 & 73 of LR	R H)	wetland hyd	drology must be present,	
					4 11 4	urbed or problematic.	
				-4/-	unless disti	and an proposition.	
Restrictive Lay	ver (if present):				uniess disti	and an promoting to	
Restrictive Lay	ver (if present):						
Type:	es):				lydric Soll Pres	sent? Yes X No	
Type:	es):	C 1A-CCU 10	ued - (ledes A		lydric Soll Pres	sent? Yes X No	_
Type:	es):	S ASSUR	ned - slopes An		lydric Soll Pres	sent? Yes X No	_
Type:	es):	s Assun	ued - slopes An		lydric Soll Pres	sent? Yes X No	_
Type: Depth (inche Remarks: #}	os):	S ASSUR	ned - slopes An		lydric Soll Pres	sent? Yes X No	_
Type: Depth (inche Remarks: #}	rs):	S ASSUR	ned - slopes An		lydric Soll Pres	sent? Yes X No	_
Type: Depth (inche Remarks: #} YDROLOGY Wetland Hydro	is):/ / DRIC Soil relogy Indicators:	2000 BO SC 100 B	* **************		tydric Soil Pres	sent? Yes_X No_	
Type: Depth (inche Remarks: #} YDROLOGY Wetland Hydro	rs):	2000 BO SC 100 B	* **************		tydric Soil Pres	sent? Yes X No	aired)
Type: Depth (inche Remarks: #} YDROLOGY Wetland Hydro	rs):	2000 BO SC 100 B	ck all that apply) Salt Crust (B11)		Secondary In Surface S	sent? Yes No	
Type: Depth (inche Remarks: #/ YDROLOGY Wetland Hydro Primary Indicato Surface Wa High Water	logy Indicators: ors (minimum of one other (A1) Table (A2)	2000 BO SC 100 B	ck all that apply) Salt Crust (B11) Aquatic Invertebrates (B13)		Secondary In Surface S Sparsely	dicators (minimum of two requirements (B6) Vegetated Concave Surface	
Type: Depth (inche Remarks: #/ YDROLOGY Wetland Hydro Primary Indicato Surface Wa High Water > Saturation (objective (A1) Table (A2) A3)	2000 BO SC 100 B	ck all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1)	LE Rip	Secondary In Surface S Sparsely Drainage	dicators (minimum of two requirements (B6) Vegetated Concave Surface Patterns (B10)	(B8)
Type: Depth (inche Remarks: #/ YDROLOGY Wetland Hydro Primary Indicato Surface Wa High Water Saturation (Water Mark	response in the control of the contr	2000 BO SC 100 B	ck all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2)	LE Rip	Secondary In Surface S Sparsely Drainage Oxidized	dicators (minimum of two requirements) Modicators (minimum of two requirements) Soil Cracks (B6) Vegetated Concave Surface Patterns (B10) Rhizospheres on Living Root	(B8)
Type: Depth (inche Remarks: #/ YDROLOGY Wetland Hydro Primary Indicate Surface Wa High Water Saturation (Water Mark Sediment D	rology Indicators: ors (minimum of one other (A1) Table (A2) A3) s (B1) eposits (B2)	2000 BO SC 100 B	ck all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Liv	LE Rip	Secondary In Surface S Sparsely Drainage Oxidized (where	dicators (minimum of two requirements) dicators (minimum of two requirements) Soil Cracks (B6) Vegetated Concave Surface Patterns (B10) Rhizospheres on Living Root etilled)	(B8)
Type: Depth (inche Remarks: #/ YDROLOGY Wetland Hydro Primary Indicato Surface Wa High Water Saturation (Water Mark	rology Indicators: ors (minimum of one other (A1) Table (A2) A3) s (B1) eposits (B2)	2000 BO SC 100 B	ck all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Liv	ing Roots (C3)	Secondary In Surface Surface Surface Condition Surface Condition Condition Surface Condition C	dicators (minimum of two requirements (Bf0) Rhizospheres on Living Root (Hilled) Burrows (C8)	(B8) s (C3)
Type: Depth (inche Remarks: #/ YDROLOGY Wetland Hydro Surface Wa High Water A Saturation (Water Mark Sediment D D'ft Deposi Algal Mat or	riogy Indicators: rs (minimum of one ter (A1) Table (A2) A3) s (B1) eposits (B2) ts (B3) Crust (B4)	2000 BO SC 100 B	ck all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Liv (where not tilled) Presence of Reduced Iron (C4)	ing Roots (C3)	Secondary In Surface S Surface S Surface S Surface S Surface S Could Sed (where Crayfish Saturatio	dicators (minimum of two requirements) Soll Cracks (B6) Vegetated Concave Surface Patterns (B10) Rhizospheres on Living Root Hilled) Burrows (C8) n Visible on Aerial Imagery (C	(B8) s (C3)
Type: Depth (inche Remarks: #/ YDROLOGY Wetland Hydro Primary Indicate Surface Wa High Water Saturation (Water Mark Sediment D Child Deposit Algal Mat or Iron Deposit	riogy Indicators: res (minimum of one leter (A1) Table (A2) A3) ss (B1) eposits (B2) ts (B3) Crust (B4) ts (B5)	e required; chec - - - - - -	ck all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Liv (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7)	ing Roots (C3)	Secondary In Surface S Surface S Surface S Surface S Condition Condition Crayfish Saturatio Geomorp	dicators (minimum of two requisions) dicators (minimum of two requisions) Soil Cracks (B6) Vegetated Concave Surface Patterns (B10) Rhizospheres on Living Root Hilled) Burrows (C8) n Visible on Aerial Imagery (Catholic Position (D2)	(B8) s (C3)
Type: Depth (inche Remarks: #/ YDROLOGY Wetland Hydro Primary Indicate Surface Wa High Water Saturation (Water Mark Sediment D Yoriff Deposi Inundation (Inundation (Inundation (Inches (Inch	riogy Indicators: rs (minimum of one ter (A1) Table (A2) A3) ss (B1) eposits (B2) ts (B3) Crust (B4) ts (B5) //sible on Aerial Im	e required; chec - - - - - -	ck all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Liv (where not tilled) Presence of Reduced Iron (C4)	ing Roots (C3)	Secondary In Surface Sparsely Drainage Oxidized (where Crayfish Saturatio Geomorp FAC-Neu	dicators (minimum of two requisions) Soil Cracks (B6) Vegetated Concave Surface Patterns (B10) Rhizospheres on Living Root tilled) Burrows (C8) In Visible on Aerial Imagery (Cohic Position (D2) Itral Test (D5)	(B8) s (C3) 9)
Type: Depth (inche Remarks: #/ YDROLOGY Wetland Hydro Primary Indicate Surface Wa High Water Saturation (Water Mark Sediment D Third Deposit Inundation (Water-Stain	riogy Indicators: res (minimum of one ter (A1) Table (A2) A3) ss (B1) eposits (B2) ts (B3) Crust (B4) ts (B5) //sible on Aerial Im ed Leaves (B9)	e required; chec - - - - - -	ck all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Liv (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7)	ing Roots (C3)	Secondary In Surface Sparsely Drainage Oxidized (where Crayfish Saturatio Geomorp FAC-Neu	dicators (minimum of two requisions) dicators (minimum of two requisions) Soil Cracks (B6) Vegetated Concave Surface Patterns (B10) Rhizospheres on Living Root Hilled) Burrows (C8) n Visible on Aerial Imagery (Catholic Position (D2)	(B8) s (C3) 9)
Type: Depth (inche Remarks: #/ YDROLOGY Wetland Hydro Primary Indicate Surface Wa High Water Saturation (Water Mark Sediment D DY Drift Deposi Inundation (Water-Stain Water-Stain	resisting of the control of the cont	e required; cher - - - - - - - agery (B7)	ck all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Liv (where not tilled) Presence of Reduced Iron (C- Thin Muck Surface (C7) Other (Explain in Remarks)	ing Roots (C3)	Secondary In Surface Sparsely Drainage Oxidized (where Crayfish Saturatio Geomorp FAC-Neu	dicators (minimum of two requisions) Soil Cracks (B6) Vegetated Concave Surface Patterns (B10) Rhizospheres on Living Root tilled) Burrows (C8) In Visible on Aerial Imagery (Cohic Position (D2) Itral Test (D5)	(B8) s (C3) 9)
Type: Depth (inche Remarks: #/ YDROLOGY Wetland Hydro Primary Indicate Surface Wa High Water Saturation (Water Mark Sediment D Confidence of the control of the control Iron Deposite Inundation (**Type: Depth (inches) **Type: Type:	resent? Yes	e required; cher	ck all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Liv (where not tilled) Presence of Reduced Iron (C- Thin Muck Surface (C7) Other (Explain in Remarks)	ing Roots (C3)	Secondary In Surface Sparsely Drainage Oxidized (where Crayfish Saturatio Geomorp FAC-Neu	dicators (minimum of two requisions) Soil Cracks (B6) Vegetated Concave Surface Patterns (B10) Rhizospheres on Living Root tilled) Burrows (C8) In Visible on Aerial Imagery (Cohic Position (D2) Itral Test (D5)	(B8) s (C3) 9)
Type: Depth (inche Remarks: YDROLOGY Wetland Hydro Primary Indicate Surface Wa High Water Saturation (Water Mark Sediment D DY Drift Deposi Inundation (Water-Stain	resent? Yes	e required; cher	ck all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Liv (where not tilled) Presence of Reduced Iron (C- Thin Muck Surface (C7) Other (Explain in Remarks) Depth (inches):	ing Roots (C3)	Secondary In Surface S Sparsely Drainage Oxidized (where Crayfish Saturatio Geomorp FAC-Neu Frost-Hea	dicators (minimum of two requisions) dicators (minimum of two requisions) Soil Cracks (B6) Vegetated Concave Surface Patterns (B10) Rhizospheres on Living Root tilled) Burrows (C8) n Visible on Aerial Imagery (Contic Position (D2) trait Test (D5) ave Hummocks (D7) (LRR F)	(B8) s (C3) 9)
Type: Depth (inche Remarks: #/ YDROLOGY Wetland Hydro Primary Indicate Surface Wa High Water Saturation (Water Mark Sediment D Thift Deposit Inundation (Water-Stain Water-Stain Water Park Water-Stain Water-Stain Water-Stain Water Water P	Indicators: Indic	e required; cher	ck all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Liv (where not tilled) Presence of Reduced Iron (C- Thin Muck Surface (C7) Other (Explain in Remarks)	ing Roots (C3)	Secondary In Surface S Sparsely Drainage Oxidized (where Crayfish Saturatio Geomorp FAC-Neu Frost-Hea	dicators (minimum of two requisions) Soil Cracks (B6) Vegetated Concave Surface Patterns (B10) Rhizospheres on Living Root tilled) Burrows (C8) In Visible on Aerial Imagery (Cohic Position (D2) Itral Test (D5)	(B8) s (C3) 9)

Remarks: WETCAMID FLOODS DUMING SPRING/ EARLY SUMMER. BANKFARL BENCH.

	City		NVER Sampling Date: 9/2/2
Applicant/Owner: CDOT			State: 0 Sampling Point: 274-
nvestigator(s): AHCINIS (MIGELDOWNIA	Sec Sec	tion, Township, Ra	ange: <u>S 23, T35, R 68W</u>
andform (hillslope, terrace, etc.): BENCH			convex, none): Slope (%):
			Long: -104.97777705 Datum: WAS
Soll Map Unit Name: Not AVAI (ABUE			NWI classification: MONE
Are climatic / hydrologic conditions on the site typical for	this time of year?	Yes X No	
Are Vegetation		17 6 2	"Normal Circumstances" present? Yes 🗶 No
Are Vegetation			eeded, explain any answers in Remarks.)
			locations, transects, important features, et
> .	N _{eeee}	III PIIII B POIIIL	iooddono, danocolo, important ioddares, ci
Hydrophytic Vegetation Present? Yes	No	Is the Sample	
Wetland Hydrology Present? Yes		within a Wetla	nd? YesX No
		T 0.	CARL PARK PENALDES
Remarks: SoutH PLATTE RIVER,			
RIVERINE, FRINGE ADTI	ACENT to	RIVER C	HANNEL.
EGETATION – Use scientific names of pla			
	Absolute Do	minant Indicator	Dominance Test worksheet:
Tree Stratum (Plot size:)	% Cover Sp	ecies? Status	Number of Dominant Species
2			That Are OBL, FACW, or FAC (excluding FAC-): (A)
3			7.111
4			Total Number of Dominant Species Across All Strata: (B)
	= To	otal Cover	Percent of Dominant Species / 00
Sapling/Shrub Stratum (Plot size: 10 DIA.)			That Are OBL, FACW, or FAC:(A/E
1. SAUX FYIGUA	3	YES HACK	Prevalence Index worksheet:
2			Total % Cover of: Multiply by:
3.			OBL species x 1 =
5.			FACW species x 2 =
	3 = To	otal Cover	FAC species x 3 =
erb Stratum (Plot size: 3/DiA.)	2244 124 124		FACU species x 4 =
PHALAMIS AMMDINACEM	80 Y		UPL species x 5 =
EcHINOCHIOA (RUS-GALLI		VO FAC	Column Totals: (A) (B)
XANTHUM STRUMARIUM	5/	VO FAC	Prevalence Index = B/A =
			Hydrophytic Vegetation Indicators:
			1 - Rapid Test for Hydrophytic Vegetation
			∠ 2 - Dominance Test is >50%
			3 - Prevalence Index is ≤3.01
			 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
0			Problematic Hydrophytic Vegetation ¹ (Explain)
7/ 5/-	_95 = To	tal Cover	
Voody Vine Stratum (Plot size: 3' D/A.)		er Ena	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
· Vitis RipaniA	1-7	ES HAC	The state of the s
	- 	tol Cover	Hydrophytic Vegetation
6 Bare Ground in Herb Stratum5		tal Cover	Present? Yes No
emarks: FRINGE ADT, to South	+ Dlaste		
MUNICIE ADJ. 10 30011	riante,		

Depth Ma			x Features			the absence of indicators.)
(inches) Color (mois	st) %	Color (moist)		Type ¹	Loc ²	Texture Remarks
0-16 104R 4	/2					FINE SAND
ype: C=Concentration, D: ydric Soil Indicators: (A) Histosol (A1) Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4) Stratified Layers (A5) (L 1 cm Muck (A9) (LRR F Depleted Below Dark St Thick Dark Surface (A12 Sandy Mucky Mineral (S 2.5 cm Mucky Peat or Peat 5 cm Mucky Peat or Peat estrictive Layer (if preser	RR F) , G, H) urface (A11) eat (S2) (LRR G, at (S3) (LRR F)	educed Matrix, CS RRs, unless other Sandy R Stripped Loamy M Loamy M Depleter Redox D Redox D H) High Pla	%	or Coated L) Ix (S4) Ix (F2) Ix (F2) Ix (F6) Ix (F6) I	Sand Gra	ins. ² Location: PL=Pore Lining, M=Matrix. Indicators for Problematic Hydric Soils ³ : 1 cm Muck (A9) (LRR I, J) Coast Prairie Redox (A16) (LRR F, G, H) Dark Surface (S7) (LRR G) High Plains Depressions (F16) (LRR H outside of MLRA 72 & 73) Reduced Vertic (F18) Red Parent Material (TF2) Very Shallow Dark Surface (TF12) Other (Explain in Remarks) Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
2.5 cm Mucky Peat or P	eat (S2) (LRR G, at (S3) (LRR F) at):	H) High Pla (MLF	ins Depress	sions (F16 of LRR H		Indicators of hydrophytic vegetation and wetland hydrology must be present,
YDROLOGY Wetland Hydrology Indicate						
Primary Indicators (minimum	of one required; of		Strole			Secondary Indicators (minimum of two required)
Surface Water (A1)		Salt Crust (Surface Soil Cracks (B6)
_ High Water Table (A2)		Aquatic Inve				Sparsely Vegetated Concave Surface (B8)
_ Saturation (A3)		Hydrogen S				∠ Drainage Patterns (B10)
Water Marks (B1)		Dry-Season	Water Tab	le (C2)		Oxidized Rhizospheres on Living Roots (C3)
Sediment Deposits (B2)		Oxidized Rh	nizospheres	on Living	Roots (C	3) (where tilled)
∑Drift Deposits (B3)		(where no	ot tilled)			Crayfish Burrows (C8)
Algal Mat or Crust (B4)		Presence of	Reduced I	ron (C4)		Saturation Visible on Aerial Imagery (C9)
_ Iron Deposits (B5)		Thin Muck S				Geomorphic Position (D2)
Inundation Visible on Aer	ial Imagery (B7)	Other (Expla				FAC-Neutral Test (D5)
Water-Stained Leaves (B						Frost-Heave Hummocks (D7) (LRR F)
eld Observations:					Г	root reside residence (D7) (ERR F)
urface Water Present?	Yes X No	Depth (inch	nec).	-2"		
	Tes NO		100)/_			
later Table Present?		Depth (inch			Separativa service	
aturation Present? ncludes capillary fringe) escribe Recorded Data (stre		Depth (inch		ous inspec		d Hydrology Present? Yes No
						AUGINENTED BY GORMUN IS FROM SOUTH PLATTE, AMY SUMMER.

Project/Site: T-70 EAST	City/County: DE	ENVER Sampling Date: 11/8/20
Applicant/Owner: CDaT		State: <u>CO</u> Sampling Point: <u>278-0</u>
nvestigator(s): ATICINS (MCELDOWN	Section, Township,	Range: 521, 735, R67W
andform (hillslope, terrace, etc.): StoRmunte	N DOND Local relief (concav	re, convex, none): CONCAVE Slope (%): O
subregion (LRR): LPR G	Lat: 39,78199615	Long: -104. 90314476 Datum: WGS
oil Map Unit Name: NOT AVAILARLE		NWI classification: _XIONE
re climatic / hydrologic conditions on the site typical for	this time of year? Yes X	
re Vegetation, Soil, or Hydrology		re "Normal Circumstances" present? Yes X No
re Vegetation //, Soil //, or Hydrology //		f needed, explain any answers in Remarks.)
		t locations, transects, important features, etc
· ·		i recursion, managere, important reatures, etc
	No Is the Samp	
	No within a Wet	tland? Yes No
	END COUNTRE	CV PCMA DEAMASS
Remarks: Stormunter pond N	EAST SHAVID CICK	ER. PENI, DEPRESSIONAL
EGETATION – Use scientific names of pl	0.000	
ree Stratum (Plot size:)	Absolute Dominant Indicator <u>% Cover Species? Status</u>	
		That Are OBL FACW or FAC
		(excluding FAC-): (A)
		_ Total Number of Dominant
		Species Across All Strata: (B)
10/2/10	= Total Cover	Percent of Dominant Species
apling/Shrub Stratum (Plot size: 10 DIA)	10 YES FACE	That Are OBL, FACW, or FAC:
	_ 10 1ES INCO	Prevalence Index worksheet:
		Total % Cover of: Multiply by:
		OBL species x 1 =
		FACW species x 2 =
2/ 01:	= Total Cover	FAC species x 3 =
erb Stratum (Plot size: 5 D/A.)	en Vec all	FACU species x 4 =
TYPHA ANGUSTIFOLIA	10 NO OBL	UPL species x 5 =
ELEOCHARIS PALMSTRIS	////VI/OBL	Column Totals: (A) (B)
		Prevalence Index = B/A =
		Hydrophytic Vegetation Indicators:
		1 - Rapid Test for Hydrophytic Vegetation
		2 - Dominance Test is >50%
		3 - Prevalence Index is ≤3.0'
		4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
		Problematic Hydrophytic Vegetation ¹ (Explain)
	= Total Cover	
oody Vine Stratum (Plot size:)	And the second s	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
	- Triblions	Hydrophytic Vegetation
Bare Ground in Herb Stratum 10	= Total Cover	Present? Yes No
		- Committee of the comm
emarks: D		
emarks: PEM		
marks: PEM		

Sampling Point:	278-01
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Depth	Matrix		Redox	Features	5			
(inches)	Color (moist)	%	Color (moist)	%	Type	_Loc ²	Texture	Remarks
0-2	104R 2/2	100					LOAM	
7-14	10416/1	65	7,54R4/6	35	C	M.PL	SANDY (OHMA
	1011-11	_0	110/10/10			11416	2400/	-07 (99)
								1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
T CC	centration, D=Deple	dian DM-D	advend Metrix CC-	Causead		d Cand Ca	ing 21 posti	Display Links Matteria
	dicators: (Applica					d Sand Gra		on: PL=Pore Lining, M=Matrix. Problematic Hydric Soils ³ :
Histosol (A	경기 기업 기업 시간 시간 시간 기업 시간 시간 기업	Die to all Li	Sandy Gl		Richard and			k (A9) (LRR I, J)
Histic Epip			Sandy Re	125 1 200 200			The second secon	irie Redox (A16) (LRR F, G, H)
Black Histi			Stripped	A CONTRACTOR OF THE PARTY OF TH				ace (S7) (LRR G)
	Sulfide (A4)		Loamy M		1000			s Depressions (F16)
_ Stratified L	ayers (A5) (LRR F)		Loamy G	leyed Mai	trix (F2)		(LRR H	outside of MLRA 72 & 73)
_ 1 cm Muck	(A9) (LRR F, G, H))	Depleted	- 0.	Contract of the contract of th		1 To 1000 Victor 1000	Vertic (F18)
	Below Dark Surface	(A11)	Redox Da					nt Material (TF2)
	Surface (A12)		Depleted					ow Dark Surface (TF12)
	cky Mineral (S1) cky Peat or Peat (S	2) /I PP G I	Redox De			16)		olain in Remarks) ydrophytic vegetation and
	y Peat or Peat (S3)			A 72 & 7				drology must be present,
_ 0 0	,, , , , , , , , , , , , , , , , , , , ,	,,	,					urbed or problematic.
estrictive La	yer (if present):	5-15-C						
Type:						- 1		
1 1 100.			_					
Depth (inche			-				Hydric Soil Pre	sent? Yes 🔀 No
Depth (inche	turated	tosu	IRFACE				Hydric Soil Pre	sent? Yes X No
Depth (inche	TURATED	to su	IRFACE				Hydric Soil Pre	sent? Yes <u>X</u> No
Depth (inche lemarks: SA	TURATED Y	to su	INFACE				Hydric Soil Pre	sent? Yes <u>X</u> No
Depth (inche emarks: SA	Y Ology Indicators:							
Depth (incheremarks: SA-	Y Ology Indicators: ors (minimum of one		heck all that apply)				Secondary In	ndicators (minimum of two required
Depth (inche emarks: SA- DROLOG* Cetland Hydro imary Indicator Surface We	Y Ology Indicators: ors (minimum of one ater (A1)		heck all that apply)	0.00	(040)		Secondary Ir	ndicators (minimum of two required Soil Cracks (B6)
Depth (inche emarks: SA	Y Diogy Indicators: ors (minimum of one ater (A1) Table (A2)		heck all that apply) Salt Crust (B Aquatic Inve	rtebrates			Secondary Ir	ndicators (minimum of two required Soil Cracks (B6) v Vegetated Concave Surface (B8)
Depth (inche emarks: SA	Y ology Indicators: ors (minimum of one ater (A1) Table (A2) (A3)		heck all that apply) Salt Crust (B Aquatic Inve	rtebrates ulfide Odo	or (C1)		Secondary Ir Surface Sparsely Drainage	ndicators (minimum of two required Soil Cracks (B6) / Vegetated Concave Surface (B8) e Patterns (B10)
Depth (inche emarks: SA	ology Indicators: ors (minimum of one ater (A1) Table (A2) (A3) (S (B1)		heck all that apply) Salt Crust (B Aquatic Inveiting Hydrogen St Dry-Season	rtebrates ulfide Odo Water Ta	or (C1) ble (C2)	pag Baste (C	Secondary Ir Surface Sparsely Drainage Oxidizec	ndicators (minimum of two required Soil Cracks (B6) / Vegetated Concave Surface (B8) e Patterns (B10) Rhizospheres on Living Roots (C3
Depth (inche emarks: SA	ology Indicators: ors (minimum of one ater (A1) Table (A2) (A3) (A3) (A5) (A6) (A6)		heck all that apply) Salt Crust (B Aquatic Inve Hydrogen Su Dry-Season	rtebrates ulfide Odo Water Ta zosphere	or (C1) ble (C2)	ng Roots (C	Secondary Ir Surface Sparsely Drainage Oxidized (where	ndicators (minimum of two required Soil Cracks (B6) / Vegetated Concave Surface (B8) e Patterns (B10) Rhizospheres on Living Roots (C3 e tilled)
Depth (inche emarks: SA	ology Indicators: ors (minimum of one ater (A1) Table (A2) (A3) (A3) (A5) (A5) (A5) (A5) (A5) (A5) (A5) (A5		heck all that apply) Salt Crust (B Aquatic Inve Hydrogen Su Dry-Season Oxidized Rhi (where not	rtebrates ulfide Odo Water Ta zosphere t tilled)	or (C1) ble (C2) s on Livir		Secondary Ir Surface Sparsely Drainage Oxidized (where Crayfish	ndicators (minimum of two required Soil Cracks (B6) r Vegetated Concave Surface (B8) e Patterns (B10) I Rhizospheres on Living Roots (C3 e tilled) Burrows (C8)
Depth (inche ternarks: SA	ology Indicators: ors (minimum of one ater (A1) Table (A2) (A3) (A3) (A3) (A3) (A3) (A3) (A3) (A3		heck all that apply) Saft Crust (B Aquatic Inve Hydrogen Su Dry-Season Oxidized Rhi (where not Presence of	rtebrates ulfide Odd Water Ta zosphere t tilled) Reduced	or (C1) ble (C2) es on Livir Iron (C4)		Secondary Ir Surface Sparsely Drainage Oxidized (where Crayfish	ndicators (minimum of two required Soil Cracks (B6) Vegetated Concave Surface (B8) Patterns (B10) Rhizospheres on Living Roots (C3 tilled) Burrows (C8) on Visible on Aerial Imagery (C9)
Depth (inche emarks: SA DROLOG* TOROLOG* Tetland Hydro- rimary Indicate Surface We High Water Saturation (Water Mark Sediment D Drift Depos Algal Mat o Iron Deposi	ology Indicators: ors (minimum of one ater (A1) Table (A2) (A3) (A3) (A3) (A3) (A3) (A3) (A3) (A3	e required; cl	heck all that apply) Saft Crust (B Aquatic Inve Hydrogen St Dry-Season Oxidized Rhi (where not Presence of Thin Muck St	rtebrates ulfide Odo Water Ta zosphere t tilled) Reduced urface (C	or (C1) ble (C2) as on Livir fron (C4)		Secondary Ir Surface Sparsely Drainage Oxidized (where Crayfish Saturatic	ndicators (minimum of two required Soil Cracks (B6) v Vegetated Concave Surface (B8) e Patterns (B10) l Rhizospheres on Living Roots (C3 e tilled) Burrows (C8) on Visible on Aerial Imagery (C9)
Depth (inche emarks: SA	y cology Indicators: ors (minimum of one ater (A1) Table (A2) (A3) (A3) (A5) (A5) (A6) (A6) (A7) (A7) (A7) (A8) (A8) (A8) (A9) (A9) (A9) (A9) (A9) (A9) (A9) (A9	e required; cl	heck all that apply) Saft Crust (B Aquatic Inve Hydrogen Su Dry-Season Oxidized Rhi (where not Presence of	rtebrates ulfide Odo Water Ta zosphere t tilled) Reduced urface (C	or (C1) ble (C2) as on Livir fron (C4)		Secondary Ir Surface Sparsey Drainagy Oxidized (where Crayfish Saturatic Geomory FAC-Nei	ndicators (minimum of two required Soil Cracks (B6) v Vegetated Concave Surface (B8) e Patterns (B10) Rhizospheres on Living Roots (C3 e tilled) Burrows (C8) on Visible on Aerial Imagery (C9) othic Position (D2) utral Test (D5)
Depth (inche emarks: SA	y cology Indicators: ors (minimum of one atter (A1) Table (A2) (A3) (A3) (A5) (A5) (A6) (A6) (A7) (A7) (A7) (A7) (A7) (A7) (A7) (A7	e required; cl	heck all that apply) Saft Crust (B Aquatic Inve Hydrogen St Dry-Season Oxidized Rhi (where not Presence of Thin Muck St	rtebrates ulfide Odo Water Ta zosphere t tilled) Reduced urface (C	or (C1) ble (C2) as on Livir fron (C4)		Secondary Ir Surface Sparsey Drainagy Oxidized (where Crayfish Saturatic Geomory FAC-Nei	ndicators (minimum of two required Soil Cracks (B6) v Vegetated Concave Surface (B8) e Patterns (B10) l Rhizospheres on Living Roots (C3 e tilled) Burrows (C8) on Visible on Aerial Imagery (C9)
Depth (inche emarks: SA- DROLOG* (etland Hydrorimary Indicate Saturation Water Mark Sediment Dorift Deposion Inundation Water-Stain eld Observation)	y ology Indicators: ors (minimum of one ater (A1) Table (A2) (A3) (A3) (A3) (A3) (A3) (A3) (A4) (A5) (A5) (A6) (A6) (A7) (A7) (A7) (A7) (A7) (A7) (A7) (A7	e required; cl	heck all that apply) Salt Crust (B Aquatic Inve Hydrogen St Dry-Season Oxidized Rhi (where not Presence of Thin Muck St Other (Explai	rtebrates ulfide Odo Water Tal zosphere t tilled) Reduced urface (C:	or (C1) ble (C2) as on Livir fron (C4)		Secondary Ir Surface Sparsey Drainagy Oxidized (where Crayfish Saturatic Geomory FAC-Nei	ndicators (minimum of two required Soil Cracks (B6) v Vegetated Concave Surface (B8) e Patterns (B10) Rhizospheres on Living Roots (C3 e tilled) Burrows (C8) on Visible on Aerial Imagery (C9) othic Position (D2) utral Test (D5)
Depth (inche temarks: SA PROLOGY Petland Hydrorimany Indicator Surface Wee High Water Saturation of Water Mark Sediment Dorift Depose Inundation of Water-Stain Water-Stain eld Observation	y ology Indicators: ors (minimum of one ater (A1) Table (A2) (A3) Sis (B1) Deposits (B2) dits (B3) or Crust (B4) dits (B5) Visible on Aerial Imaged Leaves (B9) dions: Present? Yes	e required; cl	heck all that apply) Salt Crust (B Aquatic Inveiting Hydrogen St Dry-Season Mydrogen St Oxidized Ring (where not Presence of Thin Muck St Other (Explain)	rtebrates rtebrates water Tal zosphere t tilled) Reduced urface (Ci in in Rem	or (C1) ble (C2) as on Livir fron (C4)		Secondary Ir Surface Sparsey Drainagy Oxidized (where Crayfish Saturatic Geomory FAC-Nei	ndicators (minimum of two required Soil Cracks (B6) v Vegetated Concave Surface (B8) e Patterns (B10) Rhizospheres on Living Roots (C3 e tilled) Burrows (C8) on Visible on Aerial Imagery (C9) othic Position (D2) utral Test (D5)
Depth (inche temarks: SA PROLOGY Vetland Hydrorimany Indicator Surface Weter High Water Saturation Under Deposition Dep	y ology Indicators: ors (minimum of one ater (A1) Table (A2) (A3) Seposits (B2) or Crust (B4) or Crust (B4) or Crust (B4) or Crust (B5) or Crust (B9)	e required; cl	heck all that apply) Salt Crust (B Aquatic Inveiting Hydrogen St. Dry-Season Mydrogen St. Oxidized Ring (where not Presence of Thin Muck St. Other (Explain Depth (inches Depth (inches St.)	rtebrates rtebra	or (C1) ble (C2) as on Livir fron (C4)	-	Secondary Ir Surface Sparsely Drainage Oxidized (where Crayfish Saturatic FAC-Net Frost-He	ndicators (minimum of two required Soil Cracks (B6) Vegetated Concave Surface (B8) a Patterns (B10) I Rhizospheres on Living Roots (C3) b tilled) Burrows (C8) on Visible on Aerial Imagery (C9) ohic Position (D2) utral Test (D5) ave Hummocks (D7) (LRR F)
Depth (inche temarks: SA- DROLOGY Total Hydrorimany Indicate Surface Water High Water Mark Sediment Deposition Proposition P	y lology Indicators: ors (minimum of one ater (A1) Table (A2) (A3) sis (B1) loeposits (B2) its (B3) or Crust (B4) tts (B5) ly(sible on Aerial Imaged Leaves (B9) lons: oresent? yes ent? Yes ent? Yes	e required; cl	heck all that apply) Salt Crust (B Aquatic Inveiting Hydrogen St Dry-Season Mydrogen St Oxidized Ring (where not Presence of Thin Muck St Other (Explain)	rtebrates rtebra	or (C1) ble (C2) as on Livir fron (C4)	-	Secondary Ir Surface Sparsey Drainagy Oxidized (where Crayfish Saturatic Geomory FAC-Nei	ndicators (minimum of two required Soil Cracks (B6) Vegetated Concave Surface (B8) a Patterns (B10) I Rhizospheres on Living Roots (C: a tilled) Burrows (C8) on Visible on Aerial Imagery (C9) ohic Position (D2) utral Test (D5) ave Hummocks (D7) (LRR F)
Depth (inche ternarks: SA	y lology Indicators: ors (minimum of one ater (A1) Table (A2) (A3) sis (B1) loeposits (B2) its (B3) or Crust (B4) tts (B5) ly(sible on Aerial Imaged Leaves (B9) lons: oresent? yes ent? Yes ent? Yes	e required; cl	heck all that apply) Salt Crust (B Aquatic Inveiting Aquatic Inve	rtebrates ulfide Odo Water Tai zosphere t tilled) Reduced urface (C: in in Rem es):	or (C1) ble (C2) ss on Livir Iron (C4) 7) parks)	- - - Wetlan	Secondary Ir Surface Sparsely Drainage Oxidized (where Crayfish Saturatid Geomory FAC-Net Frost-He	ndicators (minimum of two required Soil Cracks (B6) Vegetated Concave Surface (B8) a Patterns (B10) I Rhizospheres on Living Roots (Cientified Burrows (C8) on Visible on Aerial Imagery (C9) othic Position (D2) utral Test (D5) ave Hummocks (D7) (LRR F)
Popth (inche Remarks: SA- YDROLOG' Yetland Hydro- rimary Indicate Surface War High Water Saturation (Water Mark Sediment D Drift Depos Algal Mat o Iron Deposi Inundation (Water-Stain (Water-Stain (Water Water Faller Present Lable Present La	ology Indicators: ors (minimum of one ater (A1) Table (A2) (A3) (A3) (A3) (A3) (A3) (A3) (A3) (A3	e required; cl	heck all that apply) Salt Crust (B Aquatic Inveiting Aquatic Inve	rtebrates ulfide Odo Water Tai zosphere t tilled) Reduced urface (C: in in Rem es):	or (C1) ble (C2) ss on Livir Iron (C4) 7) parks)	- - - Wetlan	Secondary Ir Surface Sparsely Drainage Oxidized (where Crayfish Saturatid Geomory FAC-Net Frost-He	ndicators (minimum of two required Soil Cracks (B6) Vegetated Concave Surface (B8) a Patterns (B10) I Rhizospheres on Living Roots (C3) b tilled) Burrows (C8) on Visible on Aerial Imagery (C9) ohic Position (D2) utral Test (D5) ave Hummocks (D7) (LRR F)
Depth (inche temarks: SA- DROLOG' Vetland Hydrorimary Indicator Surface Water High Water Mark Sediment D. Drift Deposi Inundation Water-Stain eld Observation Presectudes capilla escribe Record	y lology Indicators: ors (minimum of one ater (A1) Table (A2) (A3) sis (B1) loeposits (B2) its (B3) r Crust (B4) tts (B5) lovisible on Aerial Imaged Leaves (B9) lons: Present? Yes estry fringe) ded Data (stream ga	agery (B7) No No No nuge, monito	heck all that apply) Salt Crust (B Aquatic Invertible Hydrogen St Dry-Season Oxidized Rhi (where noi Presence of Thin Muck St Other (Explai) Depth (Inche Depth (inche	rtebrates ulfide Odo Water Tal zosphere t tilled) Reduced urface (C' in in Rem ess):ess):	or (C1) ble (C2) s on Livir lron (C4) 7) earks)	- Wetlan	Secondary Ir Surface Sparsely Drainage Oxidizec (where Crayfish Saturatic FAC-Nee Frost-He	ndicators (minimum of two required Soil Cracks (B6) Vegetated Concave Surface (B8) Patterns (B10) Rhizospheres on Living Roots (C:e tilled) Burrows (C8) on Visible on Aerial Imagery (C9) ohic Position (D2) strat Test (D5) ave Hummocks (D7) (LRR F)
Depth (inche emarks: SA- DROLOG' (etland Hydrorimary Indicate Surface We High Water Saturation Of Port Deposion Inundation Water-Stain eld Observation Presecutes capilla escribe Record	y lology Indicators: ors (minimum of one ater (A1) Table (A2) (A3) sis (B1) loeposits (B2) its (B3) r Crust (B4) tts (B5) lovisible on Aerial Imaged Leaves (B9) lons: Present? Yes estry fringe) ded Data (stream ga	agery (B7) No No No nuge, monito	heck all that apply) Salt Crust (B Aquatic Invertible Hydrogen St Dry-Season Oxidized Rhi (where noi Presence of Thin Muck St Other (Explai) Depth (Inche Depth (inche	rtebrates ulfide Odo Water Tal zosphere t tilled) Reduced urface (C' in in Rem ess):ess):	or (C1) ble (C2) s on Livir lron (C4) 7) earks)	- Wetlan	Secondary Ir Surface Sparsely Drainage Oxidizec (where Crayfish Saturatic FAC-Nee Frost-He	ndicators (minimum of two required Soil Cracks (B6) Vegetated Concave Surface (B8) a Patterns (B10) I Rhizospheres on Living Roots (Cientified Burrows (C8) on Visible on Aerial Imagery (C9) othic Position (D2) utral Test (D5) ave Hummocks (D7) (LRR F)

Project/Site: I - 70 EAST	City/County: DE	Sampling Date: 11/8/2012
Applicant/Owner: CDOT		State: CO Sampling Point: 278-02
Investigator(s): ATKINS (MCEUDUMII	Section, Township, I	Range: 522, T35, R67W
Landform (hillslope, terrace, etc.): StateAmBANI		e, convex, none): NONE Slope (%): O
Subregion (LRR): LRR G		
Soil Map Unit Name: Not AVAILABUE		NWI classification: PSS
Are climatic / hydrologic conditions on the site typical for t	his time of year? Yes X No	
Are Vegetation, Soil, or Hydrology		e "Normal Circumstances" present? Yes No
Are Vegetation/, Soil/, or Hydrology/	장이밖요 " 맛요 화가는 뭐 하라면 맛이다	
		needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site map	showing sampling point	t locations, transects, important features, etc.
Hydrophytic Vegetation Present? YesX	No Is the Sample	ad Aran
Hydric Soil Present? YesX_	No within a Weti	
Wetland Hydrology Present? Yes X	No	
VEGETATION – Use scientific names of pla		CREEK. PSS, PIVERINE
	Absolute Dominant Indicator	Dominance Test worksheet:
Tree Stratum (Plot size:)	% Cover Species? Status	Number of Dominant Species
1		That Are OBL, FACW, or FAC (excluding FAC-):
3		_ Total Number of Dominant Species Across All Strata: 3 (B)
	= Total Cover	Control of the C
Sapling/Shrub Stratum (Plot size: // / D/A.)	70 1/40 5	Percent of Dominant Species That Are OBL, FACW, or FAC:(A/B)
1. SALIX EXIGUA	_ +O YES HACK	Browslance Index workshoot
2. Populus DEL tribES	5 N FAC	Total 9/ Cours of: Multiply but
3. SALIX LUTEA	5 N UPL	OBL species x1 =
4. SYMPHORICHAPOS OCCIDENTALIS	5 N UPL	FACW species x 2 =
5	82 = Total Cover	FAC species x 3 =
Herb Stratum (Plot size: 3 / DiA.		FACU species x 4 =
1. CAREX LASIOCARDA	45 YES OBL	UPL species x 5 =
2. PHALARIS ARUNDINACEA	5 NO FACE	/ Column Totals: (A) (B)
3. SOLIDAGIO CANADENSIS (?)	15 YES FACU	Prevalence Index = B/A =
1. JUNICUS EFFUSUS	/ <i>NO</i>	Hydrophytic Vegetation Indicators:
5		1 - Rapid Test for Hydrophytic Vegetation
	·	2 - Dominance Test is >50%
		3 - Prevalence Index is ≤3.01
3		4 - Morphological Adaptations¹ (Provide supporting
10.		data in Remarks or on a separate sheet)
	66 = Total Cover	Problematic Hydrophytic Vegetation¹ (Explain)
Voody Vine Stratum (Plot size:)	46-	¹Indicators of hydric soil and wetland hydrology must
		be present, unless disturbed or problematic.
		Hydrophytic
6 Bare Ground in Herb Stratum 34	= Total Cover	Vegetation Present? Yes No
Remarks: PSS ADJACENT to SAM	N CAGEK	And the state of t
133 HOJHCEMI TO SATO	is civere,	
Army Corns of Engineers	- Harrison	
		Great Plains _ Version 2.0

Depth Matrix		Redox	Feature	3			
(inches) Color (moist)	%	Color (moist)	_%	Type ¹	Loc ²	Texture	Remarks
0-5 10YR 3/2						Silty	CLAY LOAM
5-16 104R 5/1	90	7.5 YR 4/6	10	-	M.PL		LAM
5-16-10/15-11		T.218 16					COPTON
Type: C=Concentration, D=De Hydric Soil Indicators: (Applia Histosol (A1) Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4) Stratified Layers (A5) (LRR F, G, Depleted Below Dark Surfa Thick Dark Surface (A12) Sandy Mucky Mineral (S1) 2.5 cm Mucky Peat or Peat	teable to all LF F) , H) ce (A11)	RRs, unless otherv Sandy Re Stripped Loamy M Loamy G M Depleted Redox De Redox De Redox De	eyed Ma edox (S5) Matrix (S ucky Min leyed Ma Matrix (F ark Surfa Dark Sur epression	ed.) trix (S4) 6) eral (F1) trix (F2) 3) ce (F6) face (F7) s (F8)		Indicators 1 cm M Coast Dark S High P (LR Reduc Red P Very S Other	cation: PL=Pore Lining, M=Matrix. for Problematic Hydric Soils ³ : Muck (A9) (LRR I, J) Prairie Redox (A16) (LRR F, G, H) Surface (S7) (LRR G) Plains Depressions (F16) R H outside of MLRA 72 & 73) ed Vertic (F18) arent Material (TF2) thallow Dark Surface (TF12) (Explain in Remarks) of hydrophytic vegetation and
5 cm Mucky Peat or Peat (S				3 of LRR		wetland	d hydrology must be present, disturbed or problematic.
Restrictive Layer (if present):							
Type: Depth (inches):		-0				Hydric Soil	Present? Yes X No
SHT. 10 SU	reprice,						
	icharde,						
YDROLOGY						,	
/DROLOGY /etland Hydrology Indicators		book all that apply				Seconda	puladicatore (minimum of two required
YDROLOGY Vetland Hydrology Indicators rimary Indicators (minimum of			25388				ry Indicators (minimum of two required)
YDROLOGY Vetland Hydrology Indicators rimary Indicators (minimum of		Salt Crust (E	311)	/P42\		Surfa	ace Soil Cracks (B6)
YDROLOGY Vetland Hydrology Indicators rimary Indicators (minimum of Surface Water (A1) High Water Table (A2)		Salt Crust (B Aquatic Inve	111) rtebrates			Surfa Spar	ace Soil Cracks (B6) sely Vegetated Concave Surface (B8)
YDROLOGY Vetland Hydrology Indicators rimary Indicators (minimum of Surface Water (A1) High Water Table (A2) Saturation (A3)		Salt Crust (E Aquatic Inve Hydrogen Su	(11) rtebrates ulfide Ode	or (C1)		Surfa Spar Drain	ace Soil Cracks (B6) sely Vegetated Concave Surface (B8) nage Patterns (B10)
FOROLOGY Vetland Hydrology Indicators rimary Indicators (minimum of Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1)		Salt Crust (E Aquatic Inve Hydrogen St Dry-Season	i11) rtebrates ulfide Ode Water Ta	or (C1) ble (C2)		Surfa	ace Soil Cracks (B6) sely Vegetated Concave Surface (B8) nage Patterns (B10) ized Rhizospheres on Living Roots (C3
YDROLOGY Vetland Hydrology Indicators rrimary Indicators (minimum of Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2)		Salt Crust (E Aquatic Inve Hydrogen Su Dry-Season Oxidized Rhi	t11) rtebrates ulfide Odd Water Ta izosphere	or (C1) ble (C2)	ng Roots (C	Surfa Spar Spar Drair Oxid	ace Soil Cracks (B6) sely Vegetated Concave Surface (B8) nage Patterns (B10) ized Rhizospheres on Living Roots (C3 here tilled)
YDROLOGY Vetland Hydrology Indicators rimary Indicators (minimum of the firm o		Salt Crust (E Aquatic Inve Hydrogen St Dry-Season Oxidized Rhi (where no	t11) rtebrates ulfide Odd Water Ta izosphere t tilled)	or (C1) ble (C2) es on Livir		Surfa Span Oxid Oxid C3) (wl	ace Soil Cracks (B6) sely Vegetated Concave Surface (B8) nage Patterns (B10) ized Rhizospheres on Living Roots (C3 here tilled) fish Burrows (C8)
YDROLOGY Vetland Hydrology Indicators Primary Indicators (minimum of Indicators (minimum of Indicators) Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4)		Salt Crust (E Aquatic Inve Hydrogen Si Dry-Season Oxidized Rhi (where no	rtebrates ulfide Odd Water Ta izosphere t tilled) Reduced	or (C1) ble (C2) es on Livir Iron (C4)		Surfa Spar Spar Coxid C3) Cray Satu	ace Soil Cracks (B6) sely Vegetated Concave Surface (B8) nage Patterns (B10) ized Rhizospheres on Living Roots (C3 here tilled) fish Burrows (C8) ration Visible on Aerial Imagery (C9)
VDROLOGY Vetland Hydrology Indicators (minimum of immum Indicators (minimum of High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5)	: one required; c	Salt Crust (E Aquatic Inve Hydrogen Si Dry-Season Oxidized Rhi (where no Presence of Thin Muck S	rtebrates ulfide Odd Water Ta izosphere t tilled) Reduced urface (C	or (C1) ble (C2) es on Livir fron (C4)		Surfa Span Drain Oxid Cray Satu Seon	ace Soil Cracks (B6) sely Vegetated Concave Surface (B8) nage Patterns (B10) ized Rhizospheres on Living Roots (C3 here tilled) fish Burrows (C8) ration Visible on Aerial Imagery (C9) morphic Position (D2)
VDROLOGY Vetland Hydrology Indicators Immary Indicators (minimum of minimum o	: one required; c	Salt Crust (E Aquatic Inve Hydrogen Si Dry-Season Oxidized Rhi (where no	rtebrates ulfide Odd Water Ta izosphere t tilled) Reduced urface (C	or (C1) ble (C2) es on Livir fron (C4)		Surfact Spar Drain Oxid C3) (with Cray Satu X Geor FAC-	ace Soil Cracks (B6) sely Vegetated Concave Surface (B8) nage Patterns (B10) ized Rhizospheres on Living Roots (C3 here tilled) fish Burrows (C8) ration Visible on Aerial Imagery (C9) morphic Position (D2) -Neutral Test (D5)
VDROLOGY Vetland Hydrology Indicators Immary Indicators (minimum of Immary Indicators (minimum of Immary Indicators (Male Mater (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Water-Stained Leaves (B9)	: one required; c	Salt Crust (E Aquatic Inve Hydrogen Si Dry-Season Oxidized Rhi (where no Presence of Thin Muck S	rtebrates ulfide Odd Water Ta izosphere t tilled) Reduced urface (C	or (C1) ble (C2) es on Livir fron (C4)		Surfact Spar Drain Oxid C3) (with Cray Satu X Geor FAC-	ace Soil Cracks (B6) sely Vegetated Concave Surface (B8) nage Patterns (B10) ized Rhizospheres on Living Roots (C3 here tilled) fish Burrows (C8) ration Visible on Aerial Imagery (C9) morphic Position (D2)
YDROLOGY Vetland Hydrology Indicators Yetland Hydrology Indicators Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Water-Stained Leaves (B9)	: one required; c	Salt Crust (E Aquatic Inve Hydrogen Si Dry-Season Oxidized Rhi (where no Presence of Thin Muck S Other (Expla	rtebrates ulfide Odd Water Ta izosphere t tilled) Reduced urface (C in in Rem	or (C1) ble (C2) es on Livir fron (C4)		Surfact Spar Drain Oxid C3) (with Cray Satu X Geor FAC-	ace Soil Cracks (B6) sely Vegetated Concave Surface (B8) nage Patterns (B10) ized Rhizospheres on Living Roots (C3 here tilled) fish Burrows (C8) ration Visible on Aerial Imagery (C9) morphic Position (D2) -Neutral Test (D5)
YDROLOGY Vetland Hydrology Indicators rimary Indicators (minimum of Indicators (minimum of Indicators (minimum of Indicators (Minimum of Indicators) Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Water-Stained Leaves (B9) ield Observations: urface Water Present?	: one required; c Imagery (B7)	Salt Crust (E Aquatic Inve Hydrogen St Dry-Season Oxidized Rhi (where no Presence of Thin Muck S Other (Expla	rtebrates ulfide Odd Water Ta izosphere t tilled) Reduced urface (C in in Rem	or (C1) ble (C2) es on Livir fron (C4)		Surfact Spar Drain Oxid C3) (with Cray Satu X Geor FAC-	ace Soil Cracks (B6) sely Vegetated Concave Surface (B8) nage Patterns (B10) ized Rhizospheres on Living Roots (C3 here tilled) fish Burrows (C8) ration Visible on Aerial Imagery (C9) morphic Position (D2) -Neutral Test (D5)
YDROLOGY Vetland Hydrology Indicators Frimary Indicators (minimum of Indicators (minimum of Indicators) Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Water-Stained Leaves (B9) ield Observations: urface Water Present?	: one required; c Imagery (B7)	Salt Crust (E Aquatic Inve Hydrogen Si Dry-Season Oxidized Rhi (where no Presence of Thin Muck S Other (Expla	rtebrates ulfide Odd Water Ta izosphere t tilled) Reduced urface (C in in Rem	or (C1) ble (C2) es on Livir fron (C4)	-	Surfa Spar Spar Coxid Co	ace Soil Cracks (B6) sely Vegetated Concave Surface (B8) nage Patterns (B10) ized Rhizospheres on Living Roots (C3 here tilled) fish Burrows (C8) ration Visible on Aerial Imagery (C9) morphic Position (D2) -Neutral Test (D5) -Heave Hummocks (D7) (LRR F)
YDROLOGY Vetland Hydrology Indicators Primary Indicators (minimum of the state of	: Imagery (B7) //es No. //es No.	Salt Crust (E Aquatic Inve Hydrogen Si Dry-Season Oxidized Rhi (where no Presence of Thin Muck S Other (Expla	st11) rtebrates ulfide Odd Water Ta (zosphere t tilled) Reduced urface (C in in Ren ess):	or (C1) ble (C2) ble (C2) s on Livir lron (C4) 7) parks)	- - - Wetlar	Surfa Spar Spar Coxid Co	ace Soil Cracks (B6) sely Vegetated Concave Surface (B8) nage Patterns (B10) ized Rhizospheres on Living Roots (C3 here tilled) fish Burrows (C8) ration Visible on Aerial Imagery (C9) morphic Position (D2) -Neutral Test (D5)
Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Water-Stained Leaves (B9) ield Observations: urface Water Present?	: Imagery (B7) //es No. //es No.	Salt Crust (E Aquatic Inve Hydrogen Si Dry-Season Oxidized Rhi (where no Presence of Thin Muck S Other (Expla	st11) rtebrates ulfide Odd Water Ta (zosphere t tilled) Reduced urface (C in in Ren ess):	or (C1) ble (C2) ble (C2) s on Livir lron (C4) 7) parks)	- - - Wetlar	Surfa Spar Spar Coxid Co	ace Soil Cracks (B6) sely Vegetated Concave Surface (B8) nage Patterns (B10) ized Rhizospheres on Living Roots (C3 here tilled) fish Burrows (C8) ration Visible on Aerial Imagery (C9) morphic Position (D2) -Neutral Test (D5) -Heave Hummocks (D7) (LRR F)
YDROLOGY Vetland Hydrology Indicators Primary Indicators (minimum of Indicators (minimum of Indicators (minimum of Indicators (minimum of Indicators) Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Water-Stained Leaves (B9) idld Observations: urface Water Present? Atter Table Present? yet aturation Present? proludes capillary fringe) escribe Recorded Data (stream	Imagery (B7) Yes X No. Yes No. To gauge, monitor	Salt Crust (E Aquatic Inve Hydrogen St Dry-Season Oxidized Rhi (where no Presence of Thin Muck S Other (Expla	rtebrates alfide Odd Water Taizosphere t tilled) Reduced urface (C in in Remes):	or (C1) ble (C2) s on Livir lron (C4) 7) larks)	- Wetlar	Surfa Spar Spar Spar Spar Spar Spar Spar Spa	ace Soil Cracks (B6) sely Vegetated Concave Surface (B8) nage Patterns (B10) ized Rhizospheres on Living Roots (C3 here tilled) fish Burrows (C8) ration Visible on Aerial Imagery (C9) morphic Position (D2) -Neutral Test (D5) -Heave Hummocks (D7) (LRR F) Present? Yes No
/DROLOGY //etland Hydrology Indicators rimary Indicators (minimum of the firm	Imagery (B7) Yes X No. Yes No. To gauge, monitor	Salt Crust (E Aquatic Inve Hydrogen St Dry-Season Oxidized Rhi (where no Presence of Thin Muck S Other (Expla	rtebrates alfide Odd Water Taizosphere t tilled) Reduced urface (C in in Remes):	or (C1) ble (C2) s on Livir lron (C4) 7) larks)	- Wetlar	Surfa Spar Spar Spar Spar Spar Spar Spar Spa	ace Soil Cracks (B6) sely Vegetated Concave Surface (B8) hage Patterns (B10) ized Rhizospheres on Living Roots (C3 here tilled) fish Burrows (C8) ration Visible on Aerial Imagery (C9) morphic Position (D2) -Neutral Test (D5) -Heave Hummocks (D7) (LRR F) Present? Yes No

vestigator(s): ATKINS (MCLIXIU) andform (hillslope, terrace, etc.): BANKFUL	BENICH LO	cal relief (concave,	, convex, none): NOA	IE Slope (%): ∠/
ubregion (LRR): LRR G		77931463		
oil Map Unit Name: NOT AVAILABU	Ξ		NWI classific	ation: <i>PS</i> 5
e climatic / hydrologic conditions on the site typical for			(If no, explain in Re	emarks.)
e Vegetation, Soil, or Hydrology	significantly dist	turbed? Are	"Normal Circumstances" p	resent? Yes X No
e Vegetation	naturally proble	matic? (If n	eeded, explain any answer	s in Remarks.)
JMMARY OF FINDINGS - Attach site m	an showing sa	mpling point	locations transacts	important features etc
			iocations, transcotts,	important leatures, etc
일하기 있었다면서 한 10 Metric New Michigan Color Part Color Part Color Co	_ No	Is the Sample		
lydric Soil Present? Yes X Vetland Hydrology Present? Yes X	_ No	within a Wetla	nd? Yes_×	No
		1 - (1 - 12)	000	The List Section
emarks: WETLAND FRINGE A	TACENT	to SAND	CRK.	
	<i>™</i>			2
GETATION – Use scientific names of p	lants.			
ree Stratum (Plot size:)		ominant Indicator pecies? Status	Dominance Test works	
ee Stratum (Flot size.	78 COVEL SE	ecies Status	Number of Dominant Sp That Are OBL, FACW, o	
	100000000000000000000000000000000000000		(excluding FAC-):	(A)
			Total Number of Domina	int
			Species Across All Strati	
16/2	= Tr	otal Cover	Percent of Dominant Spo	ecies
apling/Shrub Stratum (Plot size: // DIA,)		Vice Ga	That Are OBL, FACW, o	
SALIX EXIGUA		YES FACU	Prevalence Index work	sheet:
			The control of the state of the second state o	Multiply by:
			Contract of the Contract of th	x1=
			FACW species	x 2 =
	/O = To	otal Cover		x3=
erb Stratum (Plot size: 3 ft, D/A)			FACU species	x 4 =
PHALARIS ARUNDINACEA		IES MACUI	UPL species	x 5 =
			Column Totals:	(A) (B)
			Prevalence Index :	= B/A =
			Hydrophytic Vegetation	
			1 - Rapid Test for Hy	drophytic Vegetation
			2 - Dominance Test	s >50%
			3 - Prevalence Index	
			4 - Morphological Ad	aptations ¹ (Provide supporting or on a separate sheet)
(r		tal Cover		ytic Vegetation ¹ (Explain)
			¹ Indicators of hydric soil a	and wetland hydrology must
ody Vine Stratum (Plot size:)			be present, unless disturt	bed or problematic.
46.46.56.66.66.66.66.66.66.66.66.66.66.66.66			Hydrophytic	
		0.00	Vegetation	The second secon
	= To	tal Cover	Present? Yes	X No
Bare Ground in Herb Stratum	= To	tal Cover		X No

Depth Matrix	Redox Features	
(inches) Color (moist) %	Color (moist) % Type Loc2	Texture Remarks
0-16" 10 YR 3/2		Sibry Clay Comm
		- Zing cing control
		· ———
Type: C=Concentration, D=Depletion, RM=F	Reduced Matrix, CS=Covered or Coated Sand (Grains. ² Location: PL=Pore Lining, M=Matrix.
Hydric Soil Indicators: (Applicable to all LI	RRs, unless otherwise noted.)	Indicators for Problematic Hydric Soils ³ :
Histosol (A1)	Sandy Gleyed Matrix (S4)	1 cm Muck (A9) (LRR I, J)
Histic Epipedon (A2)	Sandy Redox (S5)	Coast Prairie Redox (A16) (LRR F, G, H)
Black Histic (A3)	Stripped Matrix (S6)	Dark Surface (S7) (LRR G)
Hydrogen Sulfide (A4)	Loamy Mucky Mineral (F1)	High Plains Depressions (F16) (LRR H outside of MLRA 72 & 73)
Stratified Layers (A5) (LRR F) 1 cm Muck (A9) (LRR F, G, H)	Loamy Gleyed Matrix (F2) Depleted Matrix (F3)	Reduced Vertic (F18)
Depleted Below Dark Surface (A11)	Redox Dark Surface (F6)	Red Parent Material (TF2)
Thick Dark Surface (A12)	Depleted Dark Surface (F7)	Very Shallow Dark Surface (TF12)
Sandy Mucky Mineral (S1)	Redox Depressions (F8)	Other (Explain in Remarks)
2.5 cm Mucky Peat or Peat (S2) (LRR G,	H) High Plains Depressions (F16)	3Indicators of hydrophytic vegetation and
_ 5 cm Mucky Peat or Peat (S3) (LRR F)	(MLRA 72 & 73 of LRR H)	wetland hydrology must be present,
		unless disturbed or problematic.
Restrictive Layer (if present):		
Type:		
	 -	1.
Depth (inches):	- FACE FULFIUS DEFINITION	Hydric Soil Present? Yes K No
temarks: SATURATED TO SUR	- FACE. FULFIUS DEFINITION	
YDROLOGY	- FACE. FULFIUS DEFINITION	
YDROLOGY Vetland Hydrology Indicators:		N OF HYDRIC SOIL.
POROLOGY Vetland Hydrology Indicators: rimary Indicators (minimum of one required; of	check all that apply)	Secondary Indicators (minimum of two required)
YDROLOGY Vetland Hydrology Indicators: **Trimary Indicators (minimum of one required; of Surface Water (A1)	check all that apply) Salt Crust (B11)	Secondary Indicators (minimum of two required) Surface Soil Cracks (B6)
TOROLOGY Vetland Hydrology Indicators: rimary Indicators (minimum of one required; of Surface Water (A1) High Water Table (A2)	check all that apply) Salt Crust (B11) Aquatic Invertebrates (B13)	Secondary Indicators (minimum of two required) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8)
YDROLOGY Vetland Hydrology Indicators: rimary Indicators (minimum of one required; of Surface Water (A1) High Water Table (A2) Saturation (A3)	check all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1)	Secondary Indicators (minimum of two required) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10)
YDROLOGY Vetland Hydrology Indicators: rimary Indicators (minimum of one required; of Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1)	check all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2)	Secondary Indicators (minimum of two required) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3
YDROLOGY Vetland Hydrology Indicators: rimary Indicators (minimum of one required; of Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2)	check all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roots	Secondary Indicators (minimum of two required) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) (C3) (where tilled)
YDROLOGY Vetland Hydrology Indicators: Primary Indicators (minimum of one required; of Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3)	check all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roots (where not tilled)	Secondary Indicators (minimum of two required) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) (Where tilled) Crayfish Burrows (C8)
YDROLOGY Vetland Hydrology Indicators: trimary Indicators (minimum of one required; of the work of t	check all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roots (where not tilled) Presence of Reduced Iron (C4)	Secondary Indicators (minimum of two required) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) ((C3) (where tilled) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9)
YDROLOGY Vetland Hydrology Indicators: Primary Indicators (minimum of one required; of the control of the con	check all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roots (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7)	Secondary Indicators (minimum of two required) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) (where tilled) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2)
Por Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7)	check all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roots (where not tilled) Presence of Reduced Iron (C4)	Secondary Indicators (minimum of two required) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) ((C3) (where tilled) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2) FAC-Neutral Test (D5)
PROLOGY Vetland Hydrology Indicators: rimary Indicators (minimum of one required; of Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9)	check all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roots (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7)	Secondary Indicators (minimum of two required) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) (where tilled) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2)
YDROLOGY Vetland Hydrology Indicators: **Immary Indicators (minimum of one required; of the control of the co	check all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roots (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7) Other (Explain in Remarks)	Secondary Indicators (minimum of two required) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) ((C3) (where tilled) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2) FAC-Neutral Test (D5)
YDROLOGY Wetland Hydrology Indicators: **Trimary Indicators (minimum of one required; of the control of the c	check all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roots (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7) Other (Explain in Remarks)	Secondary Indicators (minimum of two required) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) ((C3) (where tilled) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2) FAC-Neutral Test (D5)
Primary Indicators (minimum of one required; of Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9) Water Water Present? Wes No Nater Table Present? Yes No	check all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roots (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7) Other (Explain in Remarks) Depth (inches): Depth (inches):	Secondary Indicators (minimum of two required) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) (Mhere tilled) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2) FAC-Neutral Test (D5) Frost-Heave Hummocks (D7) (LRR F)
Portion of the present? Weter Table Present? Water Table (A2) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9) Water-Stained Leaves (B9) Water Table Present? Yes No Notater Table Present? Yes No Pater Table Present? Yes No	check all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roots (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7) Other (Explain in Remarks) Depth (inches): Depth (inches):	Secondary Indicators (minimum of two required) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) (where tilled) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2) FAC-Neutral Test (D5) Frost-Heave Hummocks (D7) (LRR F)

Project/Site: T-70 EAST	City/County: DE	NVFR Sampling Date: 11/6/201
Applicant/Owner: CDoT		State: CO Sampling Point: 279-01
Investigator(s): Atkins (MCELDOWN	VEV Section, Township, F	Range:SZI, T35, R
Landform (hillslope, terrace, etc.): TERLACE		e, convex, none): CONICHVE Slope (%): 4/%
Subregion (LRR): LRR G	Lat: 39,777 Z1618	Long: -104, 89448206 Datum: WGS 84
Soil Map Unit Name: Not AVAILABLE		NWI classification: NONE
Are climatic / hydrologic conditions on the site typical for		
Are Vegetation	1	re "Normal Circumstances" present? YesX No
Are Vegetation, Soil, or Hydrology		needed, explain any answers in Remarks.)
	** ** *** *** ***	t locations, transects, important features, etc.
SUMMART OF FINDINGS - Attach site in	ap snowing sampling point	locations, transects, important features, etc.
Hydrophytic Vegetation Present? YesX_	No Is the Sample	ed Area
Hydric Soil Present? Yes X	No within a Wetl	land? Yes X No
Wetland Hydrology Present? Yes	_ No	
REMARKS: STORMWATER DETENHER	1 ponin south of I	- 70, WEST OF CENTRAL PARK
Boulevard, PEM, DEPA	RESSIGNAL	- Z
tem, bepr	-ESTIVATE:	
VEGETATION - Use scientific names of p	lants.	
	Absolute Dominant Indicator	Dominance Test worksheet:
Tree Stratum (Plot size:)	% Cover Species? Status	Number of Dominant Species
1		That Are OBL, FACW, or FAC (excluding FAC-):
2		(excluding FAC-):(A)
3		_ Total Number of Dominant Species Across All Strata: \$ (B)
4		Species Across All Strata.
Sapling/Shrub Stratum (Plot size:)	= Total Cover	Percent of Dominant Species That Are OBL, FACW, or FAC:
1	1020	That Ale OBL, FACVY, OF FAC: (A/B)
2.		Prevalence Index worksheet:
3		Total % Cover of:Multiply by:
4		OBL species x 1 =
5		FACW species x 2 =
Herb Stratum (Plot size: 3' DIA.)	= Total Cover	FAC species x 3 =
1. ECHINOCHION CRUS-GAUI	30 YES FAC	FACU species x 4 = UPL species x 5 =
2. CUREMIS SN.	20 YES FACE	
3. BECKMANNIA SYZIGACHNE	TO NO OBL) Column rotals (A) (B)
4. AGROSTIS STOLONIFERA	15 YES FACE	Prevalence Index = B/A =
5.		Hydrophytic Vegetation Indicators:
6.		1 - Rapid Test for Hydrophytic Vegetation
7.		2 - Dominance Test is >50%
8		3 - Prevalence Index is ≤3.0°
9		4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
10		Problematic Hydrophytic Vegetation¹ (Explain)
	75 = Total Cover	The state of the s
Woody Vine Stratum (Plot size:)		¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1		
2		Hydrophytic Vegetation
% Bare Ground in Herb Stratum	= Total Cover	Present? Yes X No No
Remarks: Site was Dail Corner Wil	of unland coeries	Wise I come a set that are the
Mitimus the site of	are se was series, a	MICH OCCUIC IN 1916 CENTRAL
TO MAIN OF THE SITE, ITTE SAWY	of the many position	WHICH OCCUR IN tHE CENTRAL NED ON THE EDGE WHERE D. OTHER Sp RUM(RI AND) PANIS Great Plains - Version 2.0
THE MATINE SPECIES AND PIONEE	IL SP. HAVE COLONIIZE	D. OTHER SP. = RUMCRI AND PANICY
S Army Corps of Engineers		Great Plains – Version 2.0

Profile Description: (Describe to the depth no Depth Matrix		x Features						
	Color (moist)		Type1	Loc ²	Texture		Remarks	
0-16 10YR 3/2 100		=			SANDY	CAM	Fil	MATERY
Type: C=Concentration, D=Depletion, RM=Red lydric Soil Indicators: (Applicable to all LRR Histosol (A1) Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4) Stratified Layers (A5) (LRR F) 1 cm Muck (A9) (LRR F, G, H) Depleted Below Dark Surface (A11) Thick Dark Surface (A12) Sandy Mucky Mineral (S1) 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)	s, unless other Sandy (Sandy F Stripped Loamy (Loamy (Deplete Redox I High Pla	rwise notes Gleyed Matrix (S6 Mucky Mines Gleyed Matrix (F3 Dark Surface d Dark Surface Depressions Lins Depres	d.) rix (S4) 8) rix (S4) 8) rix (F1) rix (F2) 3) rix (F6) face (F7) s (F8) ssions (F1)	6)	Indicators 1 cm M Coast F Dark S High PI (LRI Reduce Red Pa Very SF Cother (I	for Problema uck (A9) (LR Prairie Redox urface (S7) (ains Depress R H outside aid Vertic (F18 rent Material hallow Dark S Explain in Re of hydrophytic	(A16) (LRR I LRR G) sions (F16) of MLRA 72 i 3) (TF2) Surface (TF12 marks)	oils ³ : F, G, H) & 73)
_ 5 cm Mucky Peat or Peat (S3) (LRR F) estrictive Layer (if present): Type: Depth (inches):	(MLI	RA 72 & 73	3 of LRR	н)		disturbed or p		nt,
Remarks: SITE WAS RECENTLY FORMOVER TIME. VERY	moist th	trought	tout	Profi	IE.			306.
Vetland Hydrology Indicators:					-			
rimary Indicators (minimum of one required; che	ck all that annly	A			Secondar	v Indicators (minimum of to	vo required)
Surface Water (A1)	Salt Crust (Statutes.			A CONTRACTOR OF THE PARTY OF TH	ce Soil Crack		NO TEQUITED?
High Water Table (A2)	Aquatic Inv		(B13)				d Concave S	urface (PS)
Saturation (A3)	Hydrogen S					age Patterns		uriace (DO)
Water Marks (B1)	Dry-Seasor					E1.140.000	neres on Livin	n Roots (C3)
Sediment Deposits (B2)	Oxidized R		Activities to the second	a Roots (ere tilled)	icics on Livin	g roots (CS)
Drift Deposits (B3)	(where n		o on Livin	9 110010 (1	11 10 10 10 10 10 10 10 10 10 10 10 10 1	ish Burrows ((C8)	
Algal Mat or Crust (B4)	Presence o		Iron (C4)			100	on Aerial Imag	gery (C9)
Iron Deposits (B5)	Thin Muck				1000000	orphic Positi	SOUTH STREET	V- / (/
Inundation Visible on Aerial Imagery (B7)	Other (Expl	ain in Rem	arks)		FAC-I	Neutral Test	(D5)	
Water-Stained Leaves (B9)					Frost-	Heave Humr	nocks (D7) (I	LRR F)
eld Observations:								
rface Water Present? Yes No	L Depth (incl	nes):	_					
ater Table Present? Yes No			_					
turation Present? Yes No _>	C Depth (incl	nes):			nd Hydrology	Present? \	res X	No
escribe Recorded Data (stream gauge, monitoring	ig well, aerial pr	notos, previ	O 44-	ections), if	available:			
MUNDATION OBS. EXPECT THIS SITE					THE SO	RINGI	EANW	,
-11001111137110	, 0 00				1.0		-1.10 19	

Project/Site: I - 70 EAST	City/County:	Sampling Date: 11/6/2012
Applicant/Owner: CDOT		State: CO Sampling Point: Z79-0Z
Investigator(s): A+KiNS (MCECDIWN/E		
Landform (hillslope, terrace, etc.): StoRuwater		
Subregion (LRR): LRR G		Long: -104. 880 4/409 Datum: WAS 84
Soil Map Unit Name: Not AVAILABLE	Lat5 /, / / / / / / / /	NWI classification: NWI classification:
Are climatic / hydrologic conditions on the site typical for thi	is time of year? Yes X No	
Are Vegetation		"Normal Circumstances" present? Yes X No
Are Vegetation		needed, explain any answers in Remarks.)
		locations, transects, important features, etc.
Hydrophytic Vegetation Present? YesX N	Jo.	an agree a
Hydric Soil Present? Yes X N	ls the Sample	200.00
Wetland Hydrology Present? Yes X N	within a wetia	and? Yes No
REMARKS: STORMWATER DETENTION	DOND ON SOUTH	SIDE OF T-70 RETWEEN
CENITRAL PARIC AVE AND HA	VANIA ST. PEM/	PSS, DEPRESSIONAL.
CONTRACTOR	-	, , , ,
VEGETATION – Use scientific names of plan	its.	
	Absolute Dominant Indicator	Dominance Test worksheet:
Tree Stratum (Plot size:)	% Cover Species? Status	Number of Dominant Species
1		That Are OBL, FACW, or FAC (excluding FAC-):
2		THE PROPERTY OF THE PARTY OF TH
3		Total Number of Dominant Species Across All Strata: (B)
4		Species Across Air Strata.
Sapling/Shrub Stratum (Plot size: 10 'DIA.)	= Total Cover	Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)
1. SALIX EXIGUA	2 NO FACU	
2. POPULUS DELTOIDES (SAPLINGS,	25 YES FAC	Prevalence Index worksheet:
3		Total % Cover of:Multiply by:
4		OBL species x 1 =
5		FACW species x 2 =
Herb Stratum (Plot size: 3'D/A.)	27 = Total Cover	FACU species x 3 = FACU species x 4 =
1. ELEOCHARIS PALISTRIS	40 YEC 08/-	UPL species x 5 =
2. FCHINIOCHLOA CRUS-GAUI	20 YES FAC	Column Totals: (A) (B)
3.		(b)
4.		Prevalence Index = B/A =
5.		Hydrophytic Vegetation Indicators:
6.		1 - Rapid Test for Hydrophytic Vegetation
7		∑2 - Dominance Test is >50%
8		3 - Prevalence Index is ≤3.01
9		4 - Morphological Adaptations' (Provide supporting data in Remarks or on a separate sheet)
10		Problematic Hydrophytic Vegetation1 (Explain)
Woody Vine Stratum (Plot size:)	60 = Total Cover	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1		The state of the s
2	= Total Cover	Hydrophytic Vegetation
% Bare Ground in Herb Stratum		Present? Yes No
Remarks: PEM IN CENTED DSC	ANGIAND ENGICE	Trotal AtiColin is Donningand
Species in the WETCHID.	OFTER SPECIES -	TypHA LATIFOLIA IS DOMINAMIT XANTHUM STRUMANIUM, iA Sp., ZUMEX CRISPUS Great Plains - Version 2.0
PHRAGIMITES AUSTRIALIS, CUDER	US SD. PERSICAR	iA SD. ZUMEX CRISAUS
S Army Corps of Engineers	1	Great Plains – Version 2.0

Depth Matrix			Feature			n the absence of	33-33 <u>-37-33</u>
(inches) Color (moist)	% Color	(moist)	%	Type ¹	Loc ²	Texture	Remarks
0-0.5 GLEN/4/10Y						LOAM	
0.5-16" 10 YR 5/4	98 <u>54R</u>	5/8	2		PL	SAND_	
					_		
Type: C=Concentration, D=Depletio Hydric Soil Indicators: (Applicable Histosol (A1) Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4) Stratified Layers (A5) (LRR F) 1 cm Muck (A9) (LRR F, G, H) Depleted Below Dark Surface (A1 Thick Dark Surface (A12) Sandy Mucky Mineral (S1) 2.5 cm Mucky Peat or Peat (S2) (LR Restrictive Layer (if present):	e to all LRRs, un	Sandy Gle Sandy Re Sandy Re Stripped I Loamy Me Loamy Gle Depleted Redox Da Depleted Redox Da High Plain	rise note eyed Ma edox (S5 Matrix (S ucky Min eyed Ma Matrix (F urk Surfa Dark Su pression s Depre	ed.) htrix (S4) heral (F1) heral (F1) htrix (F2) heral (F6) hrace (F6) hrace (F7) hs (F8)	6)	Indicators fo 1 cm Muc Coast Pri Dark Sur High Plai (LRR Reduced Red Pare Very Sha X Other (Ex. Indicators of wetland h	ion: PL=Pore Lining, M=Matrix. r Problematic Hydric Soils ³ : k (A9) (LRR I, J) lific Redox (A16) (LRR F, G, H) ace (S7) (LRR G) is Depressions (F16) H outside of MLRA 72 & 73) Vertic (F18) nt Material (TF2) low Dark Surface (TF12) plain in Remarks) hydrophytic vegetation and ydrology must be present, turbed or problematic.
Type:		нурпі	ic Sd	iL, 5	ATUR		SURFACE.
Depth (inches): Remarks: Fulfi'US DEFINI WATER IN PIT A		Нурпі	c 50	iL, s	ATUR		
Depth (inches):		ну рпі	c Sd	iL, 5;	ATUR		
Depth (inches):	+ 10",		c 50	iL, 5	ATUR	ATEN to	SURFACE.
Depth (inches):	t /0',			iL, 5,	ATUR	ATEN to	
Depth (inches):	equired; check all	that apply)	11)		ATUR	Secondary Surface	S UTCFACE.
Depth (inches):	equired; check all	that apply) Salt Crust (B	11) tebrates	: (B13)	ATUR	Secondary Surface Sparse	SURFACE. Indicators (minimum of two required Soil Cracks (B6)
Depth (inches):	equired; check all	that apply) Salt Crust (B	11) tebrates	: (B13) or (C1)	Atur	Secondary Surface Sparse Drainag	ndicators (minimum of two required Soil Cracks (B6) y Vegetated Concave Surface (B8) e Patterns (B10)
Depth (inches):	equired; check all	that apply) Salt Crust (B equatic Inver	11) tebrates ilfide Od Water Ta	(B13) or (C1) able (C2)		Secondary Surface Sparse Drainag Oxidize	ndicators (minimum of two required Soil Cracks (B6) y Vegetated Concave Surface (B8) e Patterns (B10)
Depth (inches):	equired; check all	that apply) Salt Crust (B Aquatic Inver	11) rtebrates ilfide Od Water Ta zosphere	(B13) or (C1) able (C2)		Secondary Surface Sparse Drainag Oxidize	ndicators (minimum of two required Soil Cracks (B6) y Vegetated Concave Surface (B8) e Patterns (B10) d Rhizospheres on Living Roots (C3
Depth (inches): Depth (inches): Definition Definiti	equired; check all S A C	that apply) Salt Crust (B Aquatic Invertydrogen Su Dry-Season N Dxidized Rhia	11) tebrates ilfide Od Water Ta zosphere tilled)	or (C1) or (C1) able (C2) es on Livin	g Roots ((Secondary Surface Sparse Drainag Oxidize Crayfisi	ndicators (minimum of two required Soil Cracks (B6) y Vegetated Concave Surface (B8) te Patterns (B10) d Rhizospheres on Living Roots (Care tilled)
Depth (inches): Demarks: Fulfills Definit WATER IN DIT A POROLOGY Vetland Hydrology Indicators: rimary Indicators (minimum of one re Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3)	equired; check all	that apply) Salt Crust (B Equatic Invertydrogen Su Enry-Season V Existing the Substitution of the Substitu	11) tebrates lifide Odi Water Ta zosphere tilled)	i (B13) or (C1) able (C2) es on Livin	g Roots ((Secondary Surface Sparsee Drainag Oxidize C3) (whei	ndicators (minimum of two required Soil Cracks (B6) y Vegetated Concave Surface (B8) te Patterns (B10) d Rhizospheres on Living Roots (Cire tilled)
Depth (inches): Demarks: Fulfi'U\$ DEfinition Parameter IN DIT A Definition Definition	equired; check all S A F C C	that apply) Salt Crust (B equatic Invertydrogen Su ency-Season N exidized Rhia (where not bresence of I	11) rtebrates ilfide Odi Water Ta zosphere titlled) Reduced	is (B13) or (C1) able (C2) es on Livin is Iron (C4)	g Roots ((Secondary Surface Sparsee Drainag Oxidize C3) (wheel Saturate Geomo	ndicators (minimum of two required Soil Cracks (B6) y Vegetated Concave Surface (B8) te Patterns (B10) d Rhizospheres on Living Roots (C6 te tilled) b Burrows (C8) on Visible on Aerial Imagery (C9)
Depth (inches): Demarks: Fulfi'U\$ DEfinition Parameter IN DIT A Definition Definition	equired; check all S A F C C	that apply) Salt Crust (B Aquatic Invertydrogen Su Dry-Season N Dxidized Rhiz (where not bresence of Ithin Muck St	11) rtebrates ilfide Odi Water Ta zosphere titlled) Reduced	is (B13) or (C1) able (C2) es on Livin is Iron (C4)	g Roots ((Secondary Surface Sparse Drainag Oxidize Crayfist Saturati X Geomo FAC-Ne	ndicators (minimum of two required Soil Cracks (B6) y Vegetated Concave Surface (B8) te Patterns (B10) d Rhizospheres on Living Roots (C6 te tilled) in Burrows (C8) on Visible on Aerial Imagery (C9) pphic Position (D2)
Depth (inches): Temarks: Fulfi'U\$ DEFinit WATER IN DIT A (DROLOGY Vetland Hydrology Indicators: rimary Indicators (minimum of one re Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Image Water-Stained Leaves (B9)	equired; check all S A F C C	that apply) Salt Crust (B Aquatic Invertydrogen Su Dry-Season N Dxidized Rhiz (where not bresence of Ithin Muck St	11) rtebrates ilfide Odi Water Ta zosphere titlled) Reduced	is (B13) or (C1) able (C2) es on Livin is Iron (C4)	g Roots ((Secondary Surface Sparse Drainag Oxidize Crayfist Saturati X Geomo FAC-Ne	ndicators (minimum of two required Soil Cracks (B6) y Vegetated Concave Surface (B8) to Patterns (B10) d Rhizospheres on Living Roots (C3 e tilled) Burrows (C8) on Visible on Aerial Imagery (C9) thic Position (D2) tutral Test (D5)
Depth (inches): Remarks: Fulfills Definit WATER IN DIT A- YDROLOGY Vetland Hydrology Indicators: rrimary Indicators (minimum of one re X Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Image Water-Stained Leaves (B9)	equired; check all S A B C C C C C C C C C C C C C C C C C C	that apply) Salt Crust (B Aquatic Invertydrogen Su Ary-Season V Axidized Rhii (where not a continue of I hin Muck Su Other (Explain	11) rtebrates ilfide Od Water Ta zosphere tilled) Reduced urface (C	is (B13) or (C1) able (C2) es on Livin is Iron (C4)	g Roots ((Secondary Surface Sparse Drainag Oxidize Crayfist Saturati X Geomo FAC-Ne	ndicators (minimum of two required Soil Cracks (B6) y Vegetated Concave Surface (B8) te Patterns (B10) d Rhizospheres on Living Roots (C3 te tilled) n Burrows (C8) on Visible on Aerial Imagery (C9) thic Position (D2)
Depth (inches): Remarks: Fulfills Definit WATER IN DIT A YDROLOGY Vetland Hydrology Indicators: rimary Indicators (minimum of one re X Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Image Water-Stained Leaves (B9) Teld Observations: urface Water Present? Yes	equired; check all SAHCCCTTTT	that apply) Salt Crust (B Aquatic Inver dydrogen Su Dry-Season V Exidized Rhiz (where not be thin Muck Su Other (Explai	11) rtebrates ilfide Od Water Ta zosphere tilled) Reduced urface (C n in Ren	(B13) or (C1) able (C2) es on Livin B Iron (C4) (C7) narks)	g Roots ((Secondary Surface Sparse Drainag Oxidize Crayfist Saturati X Geomo FAC-Ne	ndicators (minimum of two required Soil Cracks (B6) y Vegetated Concave Surface (B8) to Patterns (B10) d Rhizospheres on Living Roots (Cae tilled) Burrows (C8) on Visible on Aerial Imagery (C9) thic Position (D2) tutral Test (D5)
Depth (inches): Remarks: Fulfi'U\$ DEFinit WATER IN DIT A YDROLOGY Vetland Hydrology Indicators: rimary Indicators (minimum of one re X Surface Water (A1) X High Water Table (A2) X Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Image Water-Stained Leaves (B9) leid Observations: urface Water Present? yes 2 aturation Present? yes 2 riculdes capillary fringe)	equired; check all sequired;	that apply) Salt Crust (B Aquatic Inverted of Salt Crust (B Aquatic Invert	11) rtebrates lifide Odi Water Ta zosphere titilled) Reduced urface (C in in Ren es):es):es):es):	(B13) or (C1) able (C2) es on Livin filmon (C4) narks)	ig Roots (0	Secondary Surface Sparsee Drainag Oxidize C3) (whee Saturate X Geomo FAC-Ne Frost-He	ndicators (minimum of two required Soil Cracks (B6) y Vegetated Concave Surface (B8) to Patterns (B10) d Rhizospheres on Living Roots (Cae tilled) Burrows (C8) on Visible on Aerial Imagery (C9) thic Position (D2) tutral Test (D5)
Depth (inches):	equired; check all	that apply) Salt Crust (B Aquatic Invertigation Substitution Substitut	11) tebrates lifide Odi Water Ta zosphere titiled) Reduced urface (C in in Ren es): es): es):	(B13) or (C1) able (C2) es on Livin filmon (C4) marks)	g Roots ((Secondary Surface Sparsee Drainag Oxidize C3) (whee Saturate X Geomo FAC-Ne Frost-He	ndicators (minimum of two required Soil Cracks (B6) y Vegetated Concave Surface (B8) e Patterns (B10) d Rhizospheres on Living Roots (City of tilled) n Burrows (C8) on Visible on Aerial Imagery (C9) phic Position (D2) cutral Test (D5) eave Hummocks (D7) (LRR F)
Depth (inches):	equired; check all	that apply) Salt Crust (B Aquatic Invertigation Substitution Substitut	11) tebrates lifide Odi Water Ta zosphere titiled) Reduced urface (C in in Ren es): es): es):	(B13) or (C1) able (C2) es on Livin filmon (C4) marks)	g Roots ((Secondary Surface Sparsee Drainag Oxidize C3) (whee Saturate X Geomo FAC-Ne Frost-He	ndicators (minimum of two required Soil Cracks (B6) y Vegetated Concave Surface (B8) e Patterns (B10) d Rhizospheres on Living Roots (C3) et tilled) n Burrows (C8) on Visible on Aerial Imagery (C9) phic Position (D2) cutral Test (D5) eave Hummocks (D7) (LRR F)
Depth (inches):	equired; check all general chec	that apply) Salt Crust (B Aquatic Invertydrogen Su Dry-Season I Doxidized Rhiz (where not presence of I thin Muck Su Depth (inche	11) rtebrates lifide Odi Water Ta zosphere tilled) Reduced urface (C n in Ren es): ss): totos, prev	(B13) or (C1) able (C2) es on Livin d Iron (C4) c7) narks)	g Roots ((Secondary Surface Sparsee Drainag Oxidize C3) (whee Saturate X Geomo FAC-Ne Frost-He	ndicators (minimum of two required Soil Cracks (B6) y Vegetated Concave Surface (B8) e Patterns (B10) d Rhizospheres on Living Roots (C3) et tilled) n Burrows (C8) on Visible on Aerial Imagery (C9) phic Position (D2) cutral Test (D5) eave Hummocks (D7) (LRR F)

pplicant/owner: CDOT	611) 9	action Township Pa	State: <u>(0</u> Sampling Point: <u>280 - 2</u> ange: <u>S ZZ, T 3S, R 6 7 W</u>
			convex, none): CONCAVE Slope (%):
ubregion (LRR): LRR G			Long: -164.87534084 Datum: WGS 9
	Lat/	11160100	
oil Map Unit Name: <u>Not A VAILABLE</u>	10.4 N 12.1 N	10	NWI classification: NONE
re climatic / hydrologic conditions on the site typical for			
re Vegetation, Soil, or Hydrology	,		"Normal Circumstances" present? Yes No
re Vegetation, Soil, or Hydrology	naturally probl	ematic? (If ne	eeded, explain any answers in Remarks.)
UMMARY OF FINDINGS - Attach site ma	p showing s	ampling point I	ocations, transects, important features, etc.
		1	
	No	Is the Sampled	i Area
1.0	No	within a Wetlan	nd? Yes No
3 STORMWATER PONDS A	1.0+1-7	-O BETWEE	EN CENTRAL PARIC AVE AND
HAVANA St.; PEM, DE,			/
		VIIC	
EGETATION – Use scientific names of pla	ants.		
		Dominant Indicator	Dominance Test worksheet:
ree Stratum (Plot size:)	-	Species? Status	Number of Dominant Species
			That Are OBL, FACW, or FAC (excluding FAC-): (A)

•			Total Number of Dominant Species Across All Strata: (B)
•		Total Cover	(AND THE CONTROL OF T
Sapling/Shrub Stratum (Plot size: 10' hiA.)			Percent of Dominant Species That Are OBL, FACW, or FAC: (A/B)
SALIX AMYGDALOIDES	_ 20	YES FACW	
		·	Prevalence Index worksheet:
			Total % Cover of:Multiply by:
•			OBL species x 1 =
			FACW species x 2 = FAC species x 3 =
lerb Stratum (Plot size: 3' Di A.)	_ZO =	Total Cover	FACU species x 4 =
TYDHA ANGUSTIFOLIA	75	YES OBL	UPL species x 5 =
SCHOENOPIECTUS PUNGENS	75	VEC ORI	Column Totals: (A) (B)
ELEOCHANIS PALISTRIS	-40-	VEC ORI	Column Fotolo.
ecra finar pri anno		100	Prevalence Index = B/A =
			Hydrophytic Vegetation Indicators:
			1 - Rapid Test for Hydrophytic Vegetation
	7000		≥ 2 - Dominance Test is >50%
			3 - Prevalence Index is ≤3.0¹
			 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
0			Problematic Hydrophytic Vegetation¹ (Explain)
	_90=1	otal Cover	
foody Vine Stratum (Plot size:)			Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
			A STATE OF THE PROPERTY OF THE
			Hydrophytic Vegetation
	=1	otal Cover	Present? Yes No
Circ. Service 189 (Control Control Service 18 19 19 19 19 19 19 19 19 19 19 19 19 19		1	
Bare Ground in Herb Stratum	h0.1 >-	1+ '0+1 P	a dilla descrita O discreta
Bare Ground in Herb Stratum	opulus De	CtoiDES, Por	TENTILLA ANSERINA, RORIGPA SP., FUA, DUCKWEED.

ndica	ators	.)		
		Rem	arks	
An	1			
04-1	n			

SOIL

Depth Matrix	Redox Feature	5	
	olor (moist) %	Type¹ Loc²	Texture Remarks
0-2 10 YR 3/2 100			Silty COAM
2-12 GLEY 15/N 90 7.	5 YR 5/8 10	C M	SANDY LOAM
¹ Type: C=Concentration, D=Depletion, RM=Redu Hydric Soil Indicators: (Applicable to all LRRs			Grains. ² Location: PL=Pore Lining, M=Matrix. Indicators for Problematic Hydric Solls ³ :
Histosol (A1) Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4)	Sandy Gleyed Ma Sandy Redox (S5) Stripped Matrix (S Loamy Mucky Min) 6)	1 cm Muck (A9) (LRR I, J) Coast Prairie Redox (A16) (LRR F, G, H) Dark Surface (S7) (LRR G) High Plains Depressions (F16)
Stratified Layers (A5) (LRR F) 1 cm Muck (A9) (LRR F, G, H) Depleted Below Dark Surface (A11)	Loamy Gleyed Ma Depleted Matrix (F Redox Dark Surfa	trix (F2) F3)	(LRR H outside of MLRA 72 & 73) Reduced Vertic (F18) Red Parent Material (TF2)
Thick Dark Surface (A12) Sandy Mucky Mineral (S1) 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) 5 cm Mucky Peat or Peat (S3) (LRR F)	 Depleted Dark Sur Redox Depression High Plains Depre (MLRA 72 & 7 	ns (F8) ssions (F16)	Very Shallow Dark Surface (TF12) Other (Explain in Remarks) Indicators of hydrophytic vegetation and wetland hydrology must be present,
Remarks: SAT. to SURFACE, W	PATER AT E	"IN pit.	
YDROLOGY			
Vetland Hydrology Indicators:			
Primary Indicators (minimum of one required; chec	k all that apply)		Secondary Indicators (minimum of two required
∑ Surface Water (A1) _	_ Salt Crust (B11)		Surface Soil Cracks (B6)
	Aquatic Invertebrates		Sparsely Vegetated Concave Surface (B8)
Saturation (A3)			Drainage Patterns (B10)
_ Water Marks (B1)	_ Dry-Season Water Ta		Oxidized Rhizospheres on Living Roots (C:
_ Sediment Deposits (B2) _	 Oxidized Rhizosphere 	es on Living Roots	
_ Drift Deposits (B3)	(where not tilled)		Crayfish Burrows (C8)
_ Algal Mat or Crust (B4)	_ Presence of Reduced		Saturation Visible on Aerial Imagery (C9)
_ Iron Deposits (B5)	_ Thin Muck Surface (C		Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7)	Other (Explain in Ren	narks)	FAC-Neutral Test (D5) Frost-Heave Hummocks (D7) (LRR F)
_ Water-Stained Leaves (B9)			Frost-neave numinocks (D7) (ERR F)
ield Observations: urface Water Present? Yes X No	Depth (inches):/	7"	
	Depth (inches):	211	
/ater Table Present? Yes No)″ Wet	tland Hydrology Present? Yes No
aturation Present? Yes No ncludes capillary fringe)			
aturation Present? Yes No	well, aerial photos, prev INI AERIAL F	Hotos.	, if available:
raturation Present? Yes No ncludes capillary fringe)	well, aerial photos, prev INI AERIAL F	Hotos.	, if available:

Project/Site: I-70 EAST		City/County: DF/	NVFR	Sampling Date: 9/1/20
Applicant/Owner: CDOT				Sampling Point: 280-0
nvestigator(s): A+Kins (M	CELDOWNEW)	Section Township I	Range: S 22 73	S RG7W
andform (hillslope, terrace, etc.): 5/3	AMUNATEN AREA	Local relief (concour	a convey cope): Cod	CALL Stars (N)
Subregion (LRR): LRR G	Jahren Jahren	39 77646183	FULL CONVEX, HORIE): CONV	1/0 297 - 1/180 8
Soil Map Unit Name: No Soil				
				cation: _\(\lambda / O\L) \(\begin{align*} \int \lambda / O\L) \(\begin{align*} \begin{align*} \begin{align*} \lambda / O\L) \(\begin{align*} \begin{align*} \lambda / O\L) \(\begin{align*} \begin{align*} \lambda / O\L) \(\begin{align*} \begin{align*} \begin{align*} \begin{align*} \lambda / O\L) \(\begin{align*} \begin{align*}
Are climatic / hydrologic conditions on t				
re Vegetation, Soil, or		-	e "Normal Circumstances"	present? Yes _X_ No
re Vegetation	Hydrology M naturally	problematic? (If	needed, explain any answe	ers in Remarks.)
SUMMARY OF FINDINGS - A	ttach site map showi	ng sampling point	locations, transects	s, important features, etc.
Hydrophytic Vegetation Present?	Yes No	- Is the Sample	-d Avan	
Hydric Soil Present?	Yes No	is the bample		
Wetland Hydrology Present?	Yes No			
Remarks: AREA COLLECTS TYPERCHANGE. TEGETATION - Use scientific	1	RUNOFF, NU	1 QUADRANT OF	FHAVANA
LOCIATION - OSC SCICILING	11.7	ite Dominant Indicator	Dominance Test work	sheet:
Tree Stratum (Plot size:		rer Species? Status		
1			_ That Are OBL, FACW,	or FAC
			(excluding FAC-):	(A)
3.			Total Number of Domin	
·			Species Across All Stra	ta: (B)
Sapling/Shrub Stratum (Plot size;		= Total Cover	Percent of Dominant Sp That Are OBL, FACW,	
			Prevalence Index wor	ksheet:
· <u> </u>			Total % Cover of:	Multiply by:
				x 1 =
				x 2 =
	_	= Total Cover	FAC species	x 3 =
lerb Stratum (Plot size: / m				× 4 =
Rumex crispus			3 83 37	x 5 =
PolyGovum Alicul		N FACU	Column Totals:	(A) (B)
			Prevalence Index	= B/A =
			Hydrophytic Vegetatio	
			1 - Rapid Test for H	
			X 2 - Dominance Test	
			3 - Prevalence Inde	x is ≤3.0 ¹
			4 - Morphological A	dantations1 (Provide supporting
),				or on a separate sheet)
	16	_ = Total Cover	The state of the s	hytic Vegetation ¹ (Explain)
foody Vine Stratum (Plot size:			¹ Indicators of hydric soil be present, unless distur	and wetland hydrology must
				3: problemation
	,, — —	- Total Carre	Hydrophytic Vegetation	
Bare Ground in Herb Stratum 8	4	_ = Total Cover		_X No
emarks: PEM, DEPHESSIO	200 Maria (1904)			
PEM DEPLECCO	mead			1
Terri, Teppession	MANC			- 1
Tem, repressi	241.6			

	Matrix		h needed to docui Redo	x Features				
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	_Loc ²	Texture	Remarks
0-5	10YR 4/1	100					SiltyC	Au
5-12	104R 5/8	_100		=			SAND	ORGANIC STREAKING
				=	_	<u>_</u>		
	oncentration, D=Depindicators: (Applica					d Sand Gr		ation: PL=Pore Lining, M=Matrix. or Problematic Hydric Soils ³ :
Black His Hydroger Stratified 1 cm Mud Depleted Thick Dar Sandy Mu 2.5 cm Mid	ipedon (A2)	i) (A11) (S2) (LRR G,	Sandy R Stripped Loamy N Loamy N Pepletec Redox D Depletec Redox D H) High Pla	eleyed Matricedox (S5) Matrix (S6) Mucky Mine Gleyed Matrix (F3 ark Surface Dark Surface pressions ins Depress A 72 & 73	eral (F1) rix (F2) 3) e (F6) ace (F7) (F8) sions (F1		Coast P Dark St High Pla (LRF Reduce Red Pai Very Sh Other (E Jindicators o wetland	uck (A9) (LRR I, J) rairie Redox (A16) (LRR F, G, H) rface (S7) (LRR G) rface (F16) rface (T8) rent Material (TF2) rent Material (
	414							
Type: Depth (inch	nes):		_				Hydric Soil P	
Type: Depth (inch	nes):	is the Sturence	COATED WITH	H IRC	N R	elox, nrst.		resent? Yes X No No
Type: Depth (inchemarks: SA	tris particle	is the Sterence	- COATED WIT WATER THAN	H Inc	W R	Enux. NHSt.		
Type:	tris particle	es the Sturance	COATED WIT	t Inc	N R	Enox. nmst.		
Depth (inchemarks: SA DROLOG etland Hydre	this particle	1.0			M R	ENOX. NHSt.	This si	TE Appenns to BE
Type:	HAID PARTICLE SY Cology Indicators: tors (minimum of on	1.0			N R THE	ŧ Pox.	This si	
Depth (inchemarks: SACCE) DROLOG Etland Hydrimary Indical Surface W High Wate	rology Indicators: tors (minimum of onlater (A1) er Table (A2)	1.0	check all that apply) Salt Crust (i	311) rtebrates (B13)	e Pox. nrst.	Secondary Surface Sparse	Indicators (minimum of two require e Soil Cracks (B6)
Depth (inchemarks: SA DROLOG etland Hydreimary Indical Surface W High Wate Saturation	rology Indicators: tors (minimum of on Vater (A1) er Table (A2) (A3)	1.0	check all that apply Salt Crust (i Aquatic Inve	311) rtebrates (B13) (C1)	Ellox, nast.	Secondary Surfac Sparse Draina	Indicators (minimum of two require e Soil Cracks (B6) bly Vegetated Concave Surface (B8) ge Patterns (B10)
Depth (inchemarks: SA DROLOG etland Hydrimary Indical Surface W High Wate Saturation Water Mar	rology Indicators: tors (minimum of on Vater (A1) er Table (A2) (A3) rks (B1)	1.0	check all that apply) Salt Crust (i Aquatic Inve Hydrogen S Dry-Season	311) Intebrates (Julfide Odor Water Tab	B13) (C1) le (C2)		Secondary Surfac Sparse Draina Oxidiz	Indicators (minimum of two require e Soil Cracks (B6) by Vegetated Concave Surface (B8) ge Patterns (B10) and Rhizospheres on Living Roots (C
Depth (inchemarks: SA DROLOG etland Hydrimary Indical Surface W High Wate Saturation Water Mar Sediment I	rology Indicators: tors (minimum of on Vater (A1) er Table (A2) (A3) rks (B1) Deposits (B2)	1.0	check all that apply) Salt Crust (to Aquatic Inve Hydrogen S Dry-Season Oxidized Rh	311) rtebrates (ulfide Odor Water Tab izospheres	B13) (C1) le (C2)		Secondary Surfac Sparse Draina Oxidiz (whe	Indicators (minimum of two require e Soil Cracks (B6) ely Vegetated Concave Surface (B8) ge Patterns (B10) ed Rhizospheres on Living Roots (Core tilled)
Depth (inchemarks: SA) DROLOG etland Hydr imary Indical Surface W High Wate Saturation Water Mar Sediment I Drift Depos	rology Indicators: tors (minimum of on Vater (A1) er Table (A2) (A3) rks (B1) Deposits (B2)	1.0	check all that apply) Salt Crust (i Aquatic Inve Hydrogen S Dry-Season	311) rtebrates (ulfide Odor Water Tab izospheres t tilled)	B13) (C1) le (C2) on Livin		Secondary Surfac Sparsa Draina Oxidiz Crayfis	Indicators (minimum of two requires e Soil Cracks (B6) sly Vegetated Concave Surface (B8) ge Patterns (B10) and Rhizospheres on Living Roots (Core tilled)
Depth (inchemarks: SA DROLOG etland Hydr imary Indical Surface W High Wate Saturation Water Mar Sediment I Drift Depos	rology Indicators: tors (minimum of on Vater (A1) (A3) (rks (B1) Deposits (B2) sits (B3) or Crust (B4)	1.0	check all that apply) Salt Crust (to Aquatic Inve Hydrogen S Dry-Season Oxidized Rh	311) Intebrates (Interpretation of the second of the seco	B13) (C1) le (C2) on Living		Secondary Surfac Spars Draina Oxidiz: (whe Craylis Satura	Indicators (minimum of two require e Soil Cracks (B6) ely Vegetated Concave Surface (B8) ge Patterns (B10) ed Rhizospheres on Living Roots (Core tilled)
Depth (inchemarks: SADE CFI) DROLOG Stand Hydremary Indical Surface W High Wate Saturation Water Mar Sediment I Drift Depos Algal Mat c Iron Depos	rology Indicators: tors (minimum of on Vater (A1) (A3) (rks (B1) Deposits (B2) sits (B3) or Crust (B4)	e required; c	check all that apply) Salt Crust (i Aquatic Inve Hydrogen S Dry-Season Oxidized Rh (where no	311) Intebrates (Interpretation of the control of	B13) (C1) le (C2) on Living		Secondary Surfac Spars Draina Oxidiz (whe Crayfis Satura	Indicators (minimum of two require e Soil Cracks (B6) ely Vegetated Concave Surface (B8) ge Patterns (B10) ed Rhizospheres on Living Roots (Cre tilled) h Burrows (C8) tion Visible on Aerial Imagery (C9)
DROLOG etland Hydr mary Indical Saturation Water Mar Sediment I Drift Depos Inundation	rology Indicators: tors (minimum of on Azer (A1) er Table (A2) (A3) Deposits (B2) sits (B3) or Crust (B4) sits (B5)	e required; c	check all that apply) Salt Crust (for a Aquatic Interest of the Crust (for a Aquatic Interest of the Crust (for a Aquatic Interest of the Crust of t	311) Intebrates (Interpretation of the control of	B13) (C1) le (C2) on Living		Secondary Surfac Spars Draina Oxidiz Crayfis Crayfis Satura Geome FAC-N	Indicators (minimum of two require e Soil Cracks (B6) ely Vegetated Concave Surface (B8) ge Patterns (B10) ed Rhizospheres on Living Roots (Core tilled) h Burrows (C8) tion Visible on Aerial Imagery (C9) orphic Position (D2)
Depth (inchemarks: SADECTION DROLOG etland Hydremary Indical Surface W. High Water Mar Sediment I Drift Depos Inundation Water-Stail id Observation	ines): This particle is y rology Indicators: tors (minimum of on /ater (A1) er Table (A2) (A3) risks (B1) Deposits (B2) sits (B3) or Crust (B4) sits (B5) Visible on Aerial Im rined Leaves (B9) tions:	e required; c	Salt Crust (i Aquatic Inve Hydrogen S Dry-Season Oxidized New (where no Presence of Thin Muck S Other (Expla	311) rtebrates (ulfide Odor Water Tab ist tilled) t tilled) urface (C7, in in Rema	B13) (C1) le (C2) on Living ron (C4)) rrks)	g Roots (C	Secondary Surfac Spars Draina Oxidiz Crayfis Crayfis Satura Geome FAC-N	Indicators (minimum of two require e Soil Cracks (B6) ely Vegetated Concave Surface (B8) ge Patterns (B10) ed Rhizospheres on Living Roots (Core tilled) h Burrows (C8) tion Visible on Aerial Imagery (C9) orphic Position (D2) eutral Test (D5)
Depth (inchemarks: SADECTION DROLOG etland Hydremary Indical Surface W. High Water Mar Sediment I Drift Depos Inundation Water-Stail id Observation	ines): This particle is y rology Indicators: tors (minimum of on /ater (A1) er Table (A2) (A3) risks (B1) Deposits (B2) sits (B3) or Crust (B4) sits (B5) Visible on Aerial Im rined Leaves (B9) tions:	e required; c	check all that apply) Salt Crust (for a Aquatic Interest of the Crust (for a Aquatic Interest of the Crust (for a Aquatic Interest of the Crust of t	311) rtebrates (ulfide Odor Water Tab ist tilled) t tilled) urface (C7, in in Rema	B13) (C1) le (C2) on Living ron (C4)) rrks)	g Roots (C	Secondary Surfac Spars Draina Oxidiz Crayfis Crayfis Satura Geome FAC-N	Indicators (minimum of two require e Soil Cracks (B6) ely Vegetated Concave Surface (B8) ge Patterns (B10) ed Rhizospheres on Living Roots (Core tilled) h Burrows (C8) tion Visible on Aerial Imagery (C9) orphic Position (D2) eutral Test (D5)
Depth (Inchemarks: SA COLOGO C	ines): In partic (exist) Frology Indicators: tors (minimum of on vater (A1) er Table (A2) (A3) risks (B1) Deposits (B2) sits (B3) or Crust (B4) sits (B5) Visible on Aerial Immed Leaves (B9) tions: Present? Yes esent? Yes	e required; c	Salt Crust (i Aquatic Inve Hydrogen S Dry-Season Oxidized RM (where no Presence of Thin Muck S Other (Expla	still) rrtebrates (uffide Odor Water Tab izospheres t tilled) Reduced Ii urface (C7 in in Rema	B13) (C1) le (C2) on Living ron (C4)) rks)	g Roots (C	Secondary Surfac Sparse Draina Oxidiz Crayfis Satura Geome FAC-N Frost-F	Indicators (minimum of two requires e Soil Cracks (B6) sly Vegetated Concave Surface (B8) ge Patterns (B10) and Rhizospheres on Living Roots (Core tilled) h Burrows (C8) tion Visible on Aerial Imagery (C9) orphic Position (D2) eutral Test (D5) leave Hummocks (D7) (LRR F)
Depth (inchemarks: SA (DROLOG (etland Hydrorimary Indica) Surface W High Wate Saturation Water Mar Sediment I Drift Depos Algal Mat o Iron Depos Inundation Water-Stale Indicate Water I water Table Pre Ituration Pres Cludes capilla	rology Indicators: tors (minimum of on Arter (A1) re Table (A2) ricks (B1) Deposits (B2) sits (B3) or Crust (B4) sits (B5) Visible on Aerial Immed Leaves (B9) tions: Present? Yes esent? Yes esent? Yes ary fringe)	e required; c	Salt Crust (for Aquatic Interest of Salt Crust) Salt Crust (for Aquatic Interest of Salt Crust) Dry-Season Oxidized Rh (where no Presence of Thin Muck Solther (Explain) Depth (inch	still) Intebrates (Intebrates (Interpretation of the little of the li	B13) (C1) le (C2) on Living ron (C4)) rks)	g Roots (C	Secondary Surfac Sparss Draina Oxidiz Crayfis Satura Secondary FAC-N Frost-H	Indicators (minimum of two require e Soil Cracks (B6) ely Vegetated Concave Surface (B8) ge Patterns (B10) ed Rhizospheres on Living Roots (Core tilled) h Burrows (C8) tion Visible on Aerial Imagery (C9) orphic Position (D2) eutral Test (D5)
Type:	respirations: Present? Parthic (e. 1) Parthic (e. 1) Parthic (e. 2) Prology Indicators: tors (minimum of on	e required; c	Salt Crust (for Aquatic Interest of Salt Crust) Salt Crust (for Aquatic Interest of Salt Crust) Dry-Season Oxidized Rh (where no Presence of Thin Muck Solther (Explain) Depth (inch	still) Intebrates (Intebrates (Interpretation of the little of the li	B13) (C1) le (C2) on Living ron (C4)) rks)	g Roots (C	Secondary Surfac Sparss Draina Oxidiz Crayfis Satura Secondary FAC-N Frost-H	Indicators (minimum of two requires e Soil Cracks (B6) sly Vegetated Concave Surface (B8) ge Patterns (B10) and Rhizospheres on Living Roots (Core tilled) h Burrows (C8) tion Visible on Aerial Imagery (C9) orphic Position (D2) eutral Test (D5) leave Hummocks (D7) (LRR F)

nvestigator(s): Atkins (
andform (hillslope, terrace, etc.): _5 (ape				/Ex Slope (%):/
ubregion (LRR): LRRG		Lat: _3			
oil Map Unit Name: No+ AV	4iLABLE			NWI classif	ication: NONE
re climatic / hydrologic conditions on	the site typica	I for this time of year	ar? Yes <u>X</u> No_	(If no, explain in	Remarks.)
re VegetationN_, SoilN_, o	r Hydrology	significantly	disturbed? Are	"Normal Circumstances"	present? Yes X No
re Vegetation _ N , Soil _ N , o	r Hydrology	naturally pro	blematic? (If n	eeded, explain any answ	ers in Remarks.)
UMMARY OF FINDINGS - A	Attach site	map showing	sampling point	locations transect	s important features e
OMMERICA OF THE DINGS OF	TO BE SEED OF STREET		Juniping point	iodations, transcot	o, important routures, e
Hydrophytic Vegetation Present?	Yes	NoX_	Is the Sample	d Area	
Hydric Soil Present?	Yes	No×	within a Wetla	nd? Yes	No_ <u></u>
Wetland Hydrology Present?	Yes	No <u></u> ×			
Remarks:					
					The state of the s
EGETATION – Use scientific		nlante			
GETATION - Use scientific	c mannes of	Absolute	Dominant Indicator	Dominance Test wor	ksheet:
ree Stratum (Plot size:		% Cover	Species? Status	Number of Dominant S	
* <u> </u>				That Are OBL, FACW,	or FAC
				(excluding FAC-):	/(A
				Total Number of Domi	
				Species Across All Str	ata: (B)
		,	= Total Cover	Percent of Dominant S	Species ~~
apling/Shrub Stratum (Plot size:				That Are OBL, FACW,	or FAC: 50% (A/
			4	Prevalence Index wo	rksheet:
					Multiply by:
				OBL species	x 1 =
				FACW species	x 2 =
			= Total Cover	FAC species	x 3 =
erb Stratum (Plot size: / M			·/ -	100	x 4 =
Rumex Chispus			Y TAC		x 5 =
PolyGonum Avicu			Y FACU	Column Totals:	(A) (E
VERBENA BRACTEA			N FACU	Prevalence Index	c = B/A =
				Hydrophytic Vegetati	
				1 - Rapid Test for I	Hydrophytic Vegetation
				2 - Dominance Tes	
				3 - Prevalence Ind	
				4 - Morphological	Adaptations ¹ (Provide supporting or on a separate sheet)
),					
		50 =	Total Cover		phytic Vegetation ¹ (Explain)
oody Vine Stratum (Plot size:)	er 1980 militario		¹ Indicators of hydric so be present, unless distr	I and wetland hydrology must
					arbed or problematic.
				Hydrophytic Vegetation	
	-	=	Total Cover		s NoX_
Rare Ground in Herb Stratum	50				
Bare Ground in Herb Stratum					

Sampling Point:	280	-0	41

0	_		٠
ວ	u	ı	L

Depth Matrix	Redox	Features			
(inches) Color (moist) %		% Type	_Loc ²	Texture	Remarks
0-12 _ 104/2 4/2 160				LOAMY	SANIS
Type: C=Concentration, D=Depletion, RM=R	aduped Matrix CC-	Couperd or Coats	40-440-	21	D. B. 11.1. 11.1.
Hydric Soil Indicators: (Applicable to all LI			a Sana Gra		n: PL=Pore Lining, M=Matrix. Problematic Hydric Soils ³ :
Histosol (A1)		yed Matrix (S4)			경기 : 100 :
Histic Epipedon (A2)	Sandy Red			All the second s	(A9) (LRR I, J) ie Redox (A16) (LRR F, G, H)
Black Histic (A3)	Stripped M				ce (S7) (LRR G)
Hydrogen Sulfide (A4)		cky Mineral (F1)			Depressions (F16)
Stratified Layers (A5) (LRR F)	Loamy Gle	yed Matrix (F2)			outside of MLRA 72 & 73)
_ 1 cm Muck (A9) (LRR F, G, H)	Depleted N	Matrix (F3)		Reduced V	ertic (F18)
Depleted Below Dark Surface (A11)		k Surface (F6)			Material (TF2)
_ Thick Dark Surface (A12)		Dark Surface (F7)			w Dark Surface (TF12)
Sandy Mucky Mineral (S1) 2.5 cm Mucky Peat or Peat (S2) (LRR G.)		oressions (F8) s Depressions (F1	61		ain in Remarks)
5 cm Mucky Peat or Peat (S2) (LRR F)		72 & 73 of LRR	7.16		drophytic vegetation and lrology must be present,
	(III.L.O.	TE G TO OI EITH	,		irbed or problematic.
testrictive Layer (if present):					or problemate.
Type:	_				
Depth (inches):	_			Hydric Soil Pres	ent? Yes No
temarks: Soil IS VERY DRY.	_			Hydric Soil Pres	ent? Yes NoX_
TOROLOGY	_			Hydric Soil Pres	ent? Yes No_X_
TOROLOGY Vetland Hydrology Indicators:					
PROLOGY Total Hydrology Indicators: Timary Indicators (minimum of one required; co	The second second second			Secondary Inc	dicators (minimum of two required
POROLOGY Torontology Indicators: Timary Indicators (minimum of one required; of a surface Water (A1)	Salt Crust (B1	A11		Secondary Inc Surface S	dicators (minimum of two required
PROLOGY Total Hydrology Indicators: Imary Indicators (minimum of one required; of a Surface Water (A1) High Water Table (A2)	Salt Crust (B1 Aquatic Invert	ebrates (B13)		Secondary Inc. Surface S Sparsely	dicators (minimum of two required toil Cracks (B6) Vegetated Concave Surface (B8)
PROLOGY Vetland Hydrology Indicators: rimary Indicators (minimum of one required; of Surface Water (A1) High Water Table (A2) Saturation (A3)	Salt Crust (B1 Aquatic Inverto Hydrogen Sulf	ebrates (B13) fide Odor (C1)		Secondary In Surface S Sparsely Drainage	dicators (minimum of two required foil Cracks (B6) Vegetated Concave Surface (B8) Patterns (B10)
PROLOGY Vetland Hydrology Indicators: rimary Indicators (minimum of one required; c Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1)	Salt Crust (B1 Aquatic Inverto Hydrogen Sult Dry-Season W	ebrates (B13) fide Odor (C1) /ater Table (C2)	- Park (O	Secondary In Surface S Sparsely Drainage Oxidized	dicators (minimum of two required foil Cracks (B6) Vegetated Concave Surface (B8) Patterns (B10) Rhizospheres on Living Roots (C3
PROLOGY Verland Hydrology Indicators: rimary Indicators (minimum of one required; c Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2)	Salt Crust (B1 Aquatic Inverte Hydrogen Sulf Dry-Season W Oxidized Rhize	ebrates (B13) fide Odor (C1) /ater Table (C2) ospheres on Livin	g Roots (C	Secondary In Surface S Sparsely Drainage Oxidized (where	dicators (minimum of two required toil Cracks (B6) Vegetated Concave Surface (B8) Patterns (B10) Rhizospheres on Living Roots (C3 tilled)
PROLOGY Verland Hydrology Indicators: rimary Indicators (minimum of one required; c Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3)	Salt Crust (B1 Aquatic Inverted Hydrogen Sulf Dry-Season W Oxidized Rhize (where not the	ebrates (B13) fide Odor (C1) /ater Table (C2) ospheres on Livin tilled)	g Roots (C	Secondary In Surface S Sparsely Drainage Oxidized (where Crayfish B	dicators (minimum of two required foil Cracks (B6) Vegetated Concave Surface (B8) Patterns (B10) Rhizospheres on Living Roots (C3 tilled)
TOROLOGY Torontomarks: Soil IS VERY DRY. Torontomarks: Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4)	Salt Crust (B1 Aquatic Inverte Hydrogen Sulf Dry-Season W Oxidized Rhize (where not to	ebrates (B13) fide Odor (C1) /ater Table (C2) ospheres on Livin tilled) educed Iron (C4)	g Roots (C	Secondary in: Surface S Sparses Drainage Oxidized (where Crayfish B Saturation	dicators (minimum of two required foil Cracks (B6) Vegetated Concave Surface (B8) Patterns (B10) Rhizospheres on Living Roots (C3 tilled) Burrows (C8)
Proposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5)	Salt Crust (B1 Aquatic Inverted Hydrogen Sulf Dry-Season W Oxidized Rhize (where not to Presence of R Thin Muck Sur	ebrates (B13) fide Odor (C1) fater Table (C2) ospheres on Livin tilled) educed Iron (C4) face (C7)	g Roots (C	Secondary Int Surface S Sparsely Drainage Oxidized (where Crayfish E Saturation Geomorpi	dicators (minimum of two required foil Cracks (B6) Vegetated Concave Surface (B8) Patterns (B10) Rhizospheres on Living Roots (C3 tilled) Burrows (C8) I Visible on Aerial Imagery (C9) nic Position (D2)
POROLOGY Torontogy T	Salt Crust (B1 Aquatic Inverte Hydrogen Sulf Dry-Season W Oxidized Rhize (where not to	ebrates (B13) fide Odor (C1) fater Table (C2) ospheres on Livin tilled) educed Iron (C4) face (C7)	g Roots (C	Secondary In Surface S Sparsely Drainage Oxidized (where Crayfish B Saturation Geomorpi FAC-Neur	dicators (minimum of two required toil Cracks (B6) Vegetated Concave Surface (B8) Patterns (B10) Rhiizospheres on Living Roots (C3 tilled) Surrows (C8) I Visible on Aerial Imagery (C9) nic Position (D2) ral Test (D5)
remarks: Soil IS VERY DRy. Proposition of the prop	Salt Crust (B1 Aquatic Inverted Hydrogen Sulf Dry-Season W Oxidized Rhize (where not to Presence of R Thin Muck Sur	ebrates (B13) fide Odor (C1) fater Table (C2) ospheres on Livin tilled) educed Iron (C4) face (C7)	g Roots (C	Secondary In Surface S Sparsely Drainage Oxidized (where Crayfish B Saturation Geomorpi FAC-Neur	dicators (minimum of two required foil Cracks (B6) Vegetated Concave Surface (B8) Patterns (B10) Rhizospheres on Living Roots (C3 tilled) Burrows (C8) I Visible on Aerial Imagery (C9) nic Position (D2)
remarks: Soil IS VERY DRY. Proposition of the prop	Salt Crust (B1 Aquatic Inverte Hydrogen Sult Dry-Season W Oxidized Rhize (where not of Presence of R Thin Muck Sur Other (Explain	ebrates (B13) fide Odor (C1) /ater Table (C2) ospheres on Livin tilled) educed Iron (C4) face (C7) in Remarks)	g Roots (C	Secondary In Surface S Sparsely Drainage Oxidized (where Crayfish B Saturation Geomorpi FAC-Neur	dicators (minimum of two required toil Cracks (B6) Vegetated Concave Surface (B8) Patterns (B10) Rhiizospheres on Living Roots (C3 tilled) Surrows (C8) I Visible on Aerial Imagery (C9) nic Position (D2) ral Test (D5)
TOROLOGY Total Hydrology Indicators: Timary Indicators (minimum of one required; cognitive Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9) ald Observations: Inface Water Present? Yes No	Salt Crust (B1 Aquatic Inverted Hydrogen Sulfed Pory-Season Website Oxidized Rhize (where not to Presence of Research Thin Muck Sure Other (Explain)	ebrates (B13) fide Odor (C1) /ater Table (C2) ospheres on Livin tilled) educed Iron (C4) face (C7) in Remarks)	g Roots (C	Secondary In Surface S Sparsely Drainage Oxidized (where Crayfish B Saturation Geomorpi FAC-Neur	dicators (minimum of two required toil Cracks (B6) Vegetated Concave Surface (B8) Patterns (B10) Rhizospheres on Living Roots (C3 tilled) Surrows (C8) I Visible on Aerial Imagery (C9) nic Position (D2) ral Test (D5)
TOROLOGY Total Hydrology Indicators: Timary Indicators (minimum of one required; of surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9) Bid Observations: Inface Water Present? Yes No atter Table Present? Yes No	Salt Crust (B1 Aquatic Inverte Hydrogen Sulf Dry-Season W Oxidized Rhize (where not to Presence of R Thin Muck Sur Other (Explain Depth (inches)	ebrates (B13) fide Odor (C1) /ater Table (C2) ospheres on Livin tilled) educed Iron (C4) face (C7) in Remarks)		Secondary Inc Surface S Sparsely Drainage Oxidized (where Crayfish B Saturation Geomorp FAC-Neut Frost-Hea	dicators (minimum of two required toil Cracks (B6) Vegetated Concave Surface (B8) Patterns (B10) Roots (Catilled) Surrows (C8) Visible on Aerial Imagery (C9) nic Position (D2) ral Test (D5) ve Hummocks (D7) (LRR F)
TOROLOGY Total Hydrology Indicators: Timary Indicators (minimum of one required; of surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9) Bid Observations: Inface Water Present? Yes No atter Table Present? Yes No	Salt Crust (B1 Aquatic Inverted Hydrogen Sulfed Pory-Season Website Oxidized Rhize (where not to Presence of Research Thin Muck Sure Other (Explain)	ebrates (B13) fide Odor (C1) /ater Table (C2) ospheres on Livin tilled) educed Iron (C4) face (C7) in Remarks)		Secondary In Surface S Sparsely Drainage Oxidized (where Crayfish B Saturation Geomorpi FAC-Neur	dicators (minimum of two required toil Cracks (B6) Vegetated Concave Surface (B8) Patterns (B10) Rhizospheres on Living Roots (C: tilled) Burrows (C8) I Visible on Aerial Imagery (C9) nic Position (D2) ral Test (D5) ve Hummocks (D7) (LRR F)
TOROLOGY Vetland Hydrology Indicators: rimary Indicators (minimum of one required; of Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9) ald Observations: Inface Water Present? Ves	Salt Crust (B1 Aquatic Inverte Hydrogen Sult Dry-Season W Oxidized Rhize (where not to Presence of R Thin Muck Sur Other (Explain Depth (inches Depth (inches	ebrates (B13) fide Odor (C1) /ater Table (C2) ospheres on Livin tilled) educed Iron (C4) face (C7) in Remarks)	Wetlan	Secondary in Surface S Sparsely Drainage Oxidized (where Crayfish B Saturation Geomorpi FAC-Neut Frost-Head	dicators (minimum of two required toil Cracks (B6) Vegetated Concave Surface (B8) Patterns (B10) Roots (C3 tilled) Surrows (C8) Visible on Aerial Imagery (C9) nic Position (D2) ral Test (D5) ve Hummocks (D7) (LRR F)
TOROLOGY Torontogy T	Salt Crust (B1 Aquatic Inverte Hydrogen Sult Dry-Season W Oxidized Rhize (where not to Presence of R Thin Muck Sur Other (Explain Depth (inches Depth (inches	ebrates (B13) fide Odor (C1) /ater Table (C2) ospheres on Livin tilled) educed Iron (C4) face (C7) in Remarks)	Wetlan	Secondary in Surface S Sparsely Drainage Oxidized (where Crayfish B Saturation Geomorpi FAC-Neut Frost-Head	dicators (minimum of two required toil Cracks (B6) Vegetated Concave Surface (B8) Patterns (B10) Rhiizospheres on Living Roots (C3 tilled) Burrows (C8) Visible on Aerial Imagery (C9) nic Position (D2) ral Test (D5) ve Hummocks (D7) (LRR F)
TOROLOGY Torology Indicators: rimary Indicators (minimum of one required; compared of the second o	Salt Crust (B1 Aquatic Inverte Hydrogen Sulf Dry-Season W Oxidized Rhize (where not to Presence of R Thin Muck Sur Other (Explain Depth (inches Depth (inches Depth (inches	ebrates (B13) fide Odor (C1) /ater Table (C2) ospheres on Livin tilled) educed Iron (C4) face (C7) in Remarks)	Wetland cotions), if a	Secondary Inc Surface S Sparsely Drainage Oxidized Crayfish E Saturation Geomorp FAC-Neut Frost-Head	dicators (minimum of two required toil Cracks (B6) Vegetated Concave Surface (B8) Patterns (B10) Roots (C3 tilled) Surrows (C8) Visible on Aerial Imagery (C9) nic Position (D2) ral Test (D5) ve Hummocks (D7) (LRR F)

Project/Site: I - 70 EAST	1		City/County:DF	NVER	Sampling Date:	9/1/20
Applicant/Owner:CDOT				State: CO	Sampling Point:	280-0
Investigator(s): ATKINS (M	ELDOUME	W)	Section, Township. F	Range: 523 T3	S. R67W	
Landform (hillslope, terrace, etc.): Ros	ADSIDE DIT	é#	Local relief (concave	e. convex. none): Conv	CAVE SION	ne (%): O
Subregion (LRR): LR16		Lat: 3º	7.7771870221	Long: -104.86536	92/8 Datus	n Was
Soil Map Unit Name: Not AVA				NWI class		
Are climatic / hydrologic conditions on t		this time of ve				
are Vegetation, Soil, or						N-
Are Vegetation, Soil, or		집 시장() [1]		e "Normal Circumstances		No
SUMMARY OF FINDINGS – A	75 CT100	St. 124.00.00	327	needed, explain any ansi locations, transec		atures, etc
Hydrophytic Vegetation Present?	Yes X				10 16 mm	
Hydric Soil Present?	Yes ×		Is the Sample		>	
Wetland Hydrology Present?	Yes 🔀		within a Wetl	and? Yes	× No	
Remarks: NE QUADRAM L OF			mue,	No.	i.	
		Absolute	Dominant Indicator	Dominance Test wo	rkshoot.	
Tree Stratum (Plot size:		% Cover	Species? Status		Species	(A)
3.				Total Number of Dom	loant	
1.				Species Across All St		(B)
Sapling/Shrub Stratum (Plot size:			= Total Cover	Percent of Dominant S That Are OBL, FACW	Species , or FAC: 100	O_ (A/B)
1. 2.				Prevalence Index wo	rksheet:	
				Total % Cover of:	Multiply	by:
				OBL species		
				FACW species		
1.		:	Total Cover	FAC species		
Plot size: 1 M. TYPHA ANGUSTIFOGI		10	V ~ P1	FACU species		
. I YPHA TINGUSTI FOUT				UPL species		
				Column Totals:	(A)	(B)
· · · · · · · · · · · · · · · · · · ·				Prevalence Index	x = B/A =	
				Hydrophytic Vegetati		
				1 - Rapid Test for		on
				2 - Dominance Te		
				3 - Prevalence Ind		
				4 - Morphological .	Adaptations¹ (Provide s or on a separate sh	
0				Problematic Hydro		
loody Vine Stratum (Plot size:		25 =	Total Cover	¹Indicators of hydric so be present, unless dist	il and wetland hydrol	ogy must
				Hydrophytic		
	-	:	Total Cover	Vegetation	×	
Bare Ground in Herb Stratum	>			Present? Ye	s_X_ No	
HE WETLAND ALSO H	omphises f has salta	15% of 12488, RA	the site. O +BBits Fout, S	LENDER WHEAT	SAMPLE PO GRASS AND I	int Kachia.
Army Corps of Engineers					Great Plains - V	ersion 2 f

그림 경우 아이 얼마나 하나 아이들이 다.	on: (Describe	to the depth	needed to docun	ent the in	dicator or	confirm	the absence of indica	itors.)	
Depth	Matrix			Features	T 1	. 2		20 6	
	OYR 2/1		Color (moist)		Type	Loc2	Texture	Remarks	
0-7 1	01K -11	100				_	Silt LOAM		
4-1_	N	100_					SANDYCLAY		
7-14	104R 5/2	40_	104R 5/8	60	C P	L,M	SAND 1		
1)						/			
						- 177	40		
				—-		_			
			educed Matrix, CS			and Gra	ains. ² Location: PL	=Pore Lining, M=Matrix.	
lydric Soil Indic	ators: (Applica	able to all LR	Rs, unless other	wise noted	1.)		Indicators for Probl	ematic Hydric Soils ³ :	
Histosol (A1)				leyed Matri	x (S4)		1 cm Muck (A9)	400 NATE 46 WIN	
_ Histic Epipede	100000000000000000000000000000000000000			edox (S5)				dox (A16) (LRR F, G, H)	
Black Histic (/ Hydrogen Sul	NAME OF TAXABLE PARTY OF TAXABLE PARTY.			Matrix (S6)			Dark Surface (S		
	ers (A5) (LRR F)	1		lucky Miner leved Matri			High Plains Dep	ide of MLRA 72 & 73)	
	9) (LRR F, G, H			Matrix (F3)			Reduced Vertic		
	w Dark Surface			ark Surface			Red Parent Mate	THE STATE OF THE S	
_ Thick Dark Su	urface (A12)	0.500,0000	Depleted	Dark Surfa	ice (F7)			rk Surface (TF12)	
Sandy Mucky			Di 1980 1880 1880 1880 1880 1880 1880 1880	epressions			Other (Explain in		
	Peat or Peat (S		. — •	ns Depress			3Indicators of hydropl		
_ 5 cm Mucky P	Peat or Peat (S3)) (LRR F) -	(MLR	A 72 & 73	of LRR H)		wetland hydrology must be present,		
estrictive Layer	(if procent):						unless disturbed	or problematic.	
	(ii present).								
Type:	_		-					\	
Depth (inches): emarks:							Hydric Soil Present?	Yes No	
DROLOGY									
etland Hydrolog	573								
	Name of the last o	e required; ch	eck all that apply)	550W.		-		rs (minimum of two required	
Surface Water			Salt Crust (E		en e		Surface Soil Ci		
_ High Water Ta	San		Aquatic Inve		333379			tated Concave Surface (B8)	
_ Saturation (A3)			Hydrogen Si		73. (2)		Drainage Patte		
_ Water Marks (E	2330		Dry-Season		Activity of the			spheres on Living Roots (C	
_ Sediment Depo			Oxidized Rh		on Living F	Roots (C			
_ Drift Deposits ((where no				Crayfish Burrov		
_ Algal Mat or Cr	and the same of th		Presence of		2001 * 00 . *			ole on Aerial Imagery (C9)	
_ Iron Deposits (I	ble on Aerial Ima	anen/(D7)	Thin Muck S Other (Expla				Geomorphic Po		
_ Mater-Stained		agery (B7)	_ Other (Expla	in in Remar	rks)		FAC-Neutral Te		
_ vvaler-Staineu							Frost-Heave Hi	ummocks (D7) (LRR F)	
old Observations		, No	Depth (inche	acl:					
	entr Tes	NO	Depth (inche						
ırface Water Pres	it Yes					W.			
urface Water Pres ater Table Preser			∠ Depth (inche)	25):		wetian	d Hydrology Present?	Yes No	
eld Observations urface Water Pres later Table Present aturation Present? acludes capillary fr									
rface Water Pres ater Table Preser turation Present? cludes capillary fr	ringe)	20	ing well, aerial pho	otos, previo	us inspecti	ons), if a	available:		

Project/Site: I - 70 EAST	City/County:	ENVER Sampling Date: 9/1/70
Applicant/Owner: CDOT		State: (1) Sampling Point: 280
nvestigator(s): ATICINS (MCELIOUN	Section Township	Range: \$ 23, 735, R67W
andform (hillslope, terrace, etc.): DRAINAGE	Local relief (conce	ve, convex, none): CONICAV F Slope (%): O.
		228 Long: -104.865397915 Datum: WGS
oil Map Unit Name: Not AVAILARLE	_ Lat	NWI classification: NOVE
re climatic / hydrologic conditions on the site typical for th		
re Vegetation, Soil, or Hydrology		re "Normal Circumstances" present? Yes 🗶 No
re Vegetation	naturally problematic? (I	f needed, explain any answers in Remarks.)
UMMARY OF FINDINGS – Attach site map	showing sampling poir	nt locations, transects, important features, etc
Hydrophytic Vegetation Present? YesX N	ls the Samp	lad Area
Hydric Soil Present? Yes N	io_X within a We	
Wetland Hydrology Present? Yes N	lo_X_	- Section 2000
Remarks: SE QUADRANT OF HAVA. AS A WETLAND IN PREVIOU	NH/T-70 INITED	CHANGE, SITE WAS MADOEN
AS A WEST AND IN DRESSION	NO ACT OF THE	EIC COURSE CHELLEN
in a werend	DICKET OF THE	UIS, SU WAS CITECIONED.
EGETATION - Use scientific names of plan	ts.	
	Absolute Dominant Indicate	
ree Stratum (Plot size:)	% Cover Species? Status	Number of Commant Species
		That Are OBL, FACW, or FAC (excluding FAC-): (A)
•		_
		Total Number of Dominant Species Across All Strata: / (B)
	= Total Cover	- '
apling/Shrub Stratum (Plot size:)	= 1 otal Cover	Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)
•		Prevalence Index worksheet:
	·	Total % Cover of: Multiply by:
		OBL species x 1 =
		FACW species x 2 =
	= Total Cover	FAC species x 3 =
erb Stratum (Plot size: / ////	AND	FACU species x 4 =
Rumer Crispus	30 Y FAC	UPL species x 5 =
UNIDENTIFIED ASTER	<u> 5 N — </u>	Column Totals: (A) (B)
		Prevalence Index = B/A =
		Hydrophytic Vegetation Indicators:
		1 - Rapid Test for Hydrophytic Vegetation
		2 - Dominance Test is >50%
		3 - Prevalence Index is ≤3.0¹
		4 - Morphological Adaptations / / Provide supporting
		data in Remarks or on a separate sheet)
	35 7415	Problematic Hydrophytic Vegetation¹ (Explain)
oody Vine Stratum (Plot size:)	35_ = Total Cover	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
		Hydrophytic
1-01	= Total Cover	Vegetation
Bare Ground in Herb Stratum		Present? Yes X No No
marks:		
DRY CHANNEC.		

Sampling Point: 280 - UPL

Depth	Color (n	Matrix	0/	Redox Features Color (moist) % Type ¹ L	oc ² Texture Remarks
(inches)	101/		100		oc <u>Texture</u> <u>Remarks</u> SiL+ Lop m
10 12		, ,			
10-12	10 YR	1/3	100 _		LOAMY SAND
					· ·
				educed Matrix, CS=Covered or Coated Sa	and Grains. ² Location: PL=Pore Lining, M=Matrix.
		Applica	ible to all LF	RRs, unless otherwise noted.)	Indicators for Problematic Hydric Soils ³ :
Histosol (15 54500000			Sandy Gleyed Matrix (S4)	1 cm Muck (A9) (LRR I, J)
Black His	pedon (A2)			Sandy Redox (S5) Stripped Matrix (S6)	Coast Prairie Redox (A16) (LRR F, G, H) Dark Surface (S7) (LRR G)
	Sulfide (A4)		Loamy Mucky Mineral (F1)	High Plains Depressions (F16)
	Layers (A5)	30.)	Loamy Gleyed Matrix (F2)	(LRR H outside of MLRA 72 & 73)
1 cm Muc	k (A9) (LRR	F, G, H)	Depleted Matrix (F3)	Reduced Vertic (F18)
The state of the s	Below Dark		(A11)	Redox Dark Surface (F6)	Red Parent Material (TF2)
	Surface (A	13414 Til.		Depleted Dark Surface (F7)	Very Shallow Dark Surface (TF12)
	cky Mineral	Marie Control	0\ /I BD C	Redox Depressions (F8)	Other (Explain in Remarks)
	cky Peat or P		2) (LRR G, F	High Plains Depressions (F16) (MLRA 72 & 73 of LRR H)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present,
_ 3 617 9/00	y reacon r	car (oo)	(LICIT)	(MEION 12 & 13 OI ERR II)	unless disturbed or problematic.
Restrictive La	yer (if pres	ent):			
Type:				-	
Depth (inch	es):	•		-	Hydric Soil Present? Yes No
Depth (inch Remarks:		Lic S	oil IN	- - Dicators observed	
Depth (incherents:	o HyDA	Lic S	oil IN	- - Dicators observed	
Depth (incherent incherent	o HyDA		oil IN	- - Dicators observed	
Depth (inche Remarks: YDROLOG Vetland Hydro	Y ology Indica	ators:			
Depth (inche Remarks: YDROLOG' Vetland Hydro	o Hyl)// Y plogy Indica	ators:		neck all that apply)	Secondary Indicators (minimum of two required)
Depth (Inche Remarks: YDROLOG Yotland Hydro Primary Indicate Surface Wa	y of Hyl)/a y ology Indica ors (minimu ater (A1)	ators:		neck all that apply) Salt Crust (B11)	Secondary Indicators (minimum of two required) Surface Soil Cracks (B6)
Depth (Inche Remarks: YDROLOG Yetland Hydro Primary Indicate Surface Water High Water	y ology Indicators (minimulater (A1) Table (A2)	ators:		neck all that apply) Sait Crust (B11) Aquatic Invertebrates (B13)	Secondary Indicators (minimum of two required) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8)
Depth (Inchesemarks: YDROLOG Yetland Hydro Primary Indicate Surface Water High Water Saturation	o HyDra ology Indica ors (minimu ater (A1) Table (A2)	ators:		neck all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1)	Secondary Indicators (minimum of two required) Surface Soll Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10)
Depth (Inche Remarks: YDROLOG Vetland Hydro Inimary Indicate Surface Wetligh Water Saturation Water Mark	o HyDra ology Indica ors (minimu ater (A1) Table (A2) (A3) is (B1)	ators: m of one		neck all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2)	Secondary Indicators (minimum of two required) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3
Depth (Inche Remarks: YDROLOG' Vetland Hydro Primary Indicate Surface Water High Water Saturation Water Mark Sediment D	of Hylling Indicators (minimulater (A1) Table (A2) (A3) (A3) (A3) (A6) (A6)	ators: m of one		neck all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxldized Rhizospheres on Living Ro	Secondary Indicators (minimum of two required) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) (where tilled)
Popth (Inches Remarks: YDROLOG' Vetland Hydro Primary Indicate Surface Water High Water Saturation Water Mark Sediment D Drift Deposi	y ology Indicators (minimuster (A1) Table (A2) (A3) Is (B1) Iteposits (B2) Its (B3)	ators: m of one		neck all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Ro	Secondary Indicators (minimum of two required) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) (where tilled) Crayfish Burrows (C8)
Popth (Inche Remarks: YDROLOG' Yetland Hydro Primary Indicate Surface Wa High Water Saturation Water Mark Sediment D Drift Depos Algal Mat o	y ology Indicates the first (Marketter (Mar	ators: m of one		neck all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Ro (where not tilled) Presence of Reduced Iron (C4)	Secondary Indicators (minimum of two required) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) (where tilled) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9)
Depth (Inche Remarks: YDROLOG' Vetland Hydro Frimary Indicate Surface Water High Water Saturation Water Mark Sediment D Drift Deposi	o Hyl)/// pology Indicates (A1) Table (A2) (A3) so (B1) teposits (B2) to Crust (B4) ts (B5)	ators: m of one	e required; c	neck all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Ro	Secondary Indicators (minimum of two required) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) (where tilled) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2)
Depth (Inche Remarks: YDROLOG' Wetland Hydror rimary Indicate Surface Wat High Water Saturation Water Mark Sediment D Drift Deposi Algal Mat on	y Sology Indicators (minimu ster (A1) Table (A2) (A3) So (B1) eposits (B2) to Crust (B4) ts (B5) //sible on A	ators: m of one	e required; c	eck all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Ro (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7)	Secondary Indicators (minimum of two required) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) (where tilled) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9)
Depth (Inche Remarks: YDROLOG Wetland Hydrorimany Indicate Surface Work High Water Saturation Water Mark Sediment D Drift Depose Algal Mat of Iron Depose Inundation Water-Stain	of Hyl)/// y slogy Indicators (minimulater (A1) Table (A2) (A3) tepposits (B2) ts (B3) Crust (B4) ts (B5) //sible on A ed Leaves	ators: m of one	e required; ch	Saft Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Ro (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7) Other (Explain in Remarks)	Secondary Indicators (minimum of two required) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) (where tilled) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2) FAC-Neutral Test (D5)
Depth (Inche Remarks: YDROLOG Vetland Hydrorimary Indicate Surface Work High Water Saturation Water Mark Sediment D Drift Depose Algal Mat of Iron Deposi Inundation Water-Stain eld Observati	of Hyll/Market (A1) Table (A2) (A3) Leposits (B3) Crust (B4) Lis (B5) Visible on A ed Leaves ons:	ators: m of one	e required; ch	eck all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Ro (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7)	Secondary Indicators (minimum of two required) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) (where tilled) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2) FAC-Neutral Test (D5)
Depth (Inche Remarks: YDROLOG Wetland Hydro rimary Indicate Surface Water High Water Saturation Water Mark Sediment D Drift Depose Algal Mat or Iron Deposi Inundation Water-Stain eld Observati urface Water P	of Hyll/Market (A1) Table (A2) (A3) Eleposits (B3) Crust (B4) Is (B5) Visible on A ed Leaves ons: resent?	ators: m of one) erial Ima (B9)	e required; ch	Saft Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Ro (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7) Other (Explain in Remarks)	Secondary Indicators (minimum of two required) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) (where tilled) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2) FAC-Neutral Test (D5)
Popth (inche Remarks: YDROLOG Votland Hydro Primary Indicate Surface Water High Water Mark Sediment D Drift Deposi Inundation Water-Stain eld Observati urface Water Pater fater Table Preseturation Preset	y of Hyl)/// y ology Indicators (minimu ster (A1) Table (A2) (A3) Is (B1) Is (B3) Is (B4) Is (B5) Is (B5) Is (B6) Is (B6) Is (B7) Is (ators: m of one) erial Ima (B9) Yes	e required; ch	meck all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Ro (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7) Other (Explain in Remarks)	Secondary Indicators (minimum of two required) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) (where tilled) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2) FAC-Neutral Test (D5)
Popth (Inche Remarks: YDROLOG' Vetland Hydro Primary Indicate Surface Wa High Water Saturation Water Mark Sediment D Drift Deposi Inundation Water-Stain eld Observati raface Water P later Table Pre	o Hyl)/// y plogy Indice pres (minimu siter (A1) TAble (A2) (A3) s (B1) eposits (B3) r Crust (B4) ts (B5) //sible on A ed Leaves ons: resent? sent? y fringe)	ators: m of one) erial Ima (B9) Yes Yes	agery (B7) NoNoNo	meck all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Ro (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7) Other (Explain in Remarks)	Secondary Indicators (minimum of two required) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) (where tilled) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2) FAC-Neutral Test (D5) Frost-Heave Hummocks (D7) (LRR F)
Depth (Inche Remarks: YDROLOG' Wetland Hydror Primary Indicate Surface Water Mark Sediment Dorift Depose Algal Mat on Iron Deposi Inundation Veter Stain eld Observation Presse aturation Presse	of Hyl)/// y Slogy Indicators (minimulater (A1) Table (A2) (A3) Table (A2) (A3) Table (A2) (A3) Table (A2) (A3) Table (A2) Table (A3) Table (A	ators: m of one) erial Ima (B9) Yes Yes Yes	agery (B7) NoNo uge, monitor	Sait Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Ro (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7) Other (Explain In Remarks) Depth (inches): Depth (inches): Depth (inches): Depth (inches):	Secondary Indicators (minimum of two required) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) (where tilled) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2) FAC-Neutral Test (D5) Frost-Heave Hummocks (D7) (LRR F)
Depth (Inche Remarks: YDROLOG' Wetland Hydror Primary Indicate Surface Water Mark Sediment Dorift Depose Algal Mat on Iron Deposi Inundation Veter Stain eld Observation Presse aturation Presse	of Hyl)/// y Slogy Indicators (minimulater (A1) Table (A2) (A3) Table (A2) (A3) Table (A2) (A3) Table (A2) (A3) Table (A2) Table (A3) Table (A	ators: m of one) erial Ima (B9) Yes Yes Yes	agery (B7) NoNo uge, monitor	Sait Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Ro (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7) Other (Explain In Remarks) Depth (inches): Depth (inches): Depth (inches): Depth (inches):	Secondary Indicators (minimum of two required) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) (where tilled) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2) FAC-Neutral Test (D5) Frost-Heave Hummocks (D7) (LRR F)

Project/Site: I-70 Bridge Over Havana Street		City/Count	ty: Denver		Sampling [Date: 4-12-13	}
Applicant/Owner: CDOT				State: CO			
				nge: Section 22, Towns			t
Landform (hillslope, terrace, etc.): Ditch		Local relie	ef (concave,	convex, none): concav	e	_ Slope (%):	1
Subregion (LRR): G- Western Great Plains	Lat:			Long:		Datum: NAI	D83
Soil Map Unit Name: Unmapped				NWI class	ification: N/A		
Are climatic / hydrologic conditions on the site typical for the	nis time of yea	ar? Yes_	No <u>x</u>	(If no, explain in	ı Remarks.)		
Are Vegetation, Soil, or Hydrology	significantly	disturbed?	? Are "	Normal Circumstances	" present? You	es x N	0
Are Vegetation, Soil, or Hydrology	naturally pro	blematic?	(If ne	eded, explain any ansv	wers in Remar	ks.)	
SUMMARY OF FINDINGS - Attach site map	showing	sampli	ng point l	ocations, transec	ts, importa	ant feature	s, etc.
Hydrophytic Vegetation Present? Yes X	No						
Hydric Soil Present? Yes x	No		the Sampled				
Wetland Hydrology Present? Yes X	No	Wit	thin a Wetlar	nd? Yes <u>^</u>	No		
Remarks:		I					
*Severe drought (http://droughtmonitor.unl.edu) Ditch along Havana, south of concrete-lined ditch.							
-							
VEGETATION – Use scientific names of pla							
Tree Stratum (Plot size: 30 Ft radius	Absolute % Cover		nt Indicator ? Status	Dominance Test wo			
1				Number of Dominant That Are OBL, FACV			
2.				(excluding FAC-):	_		(A)
3				Total Number of Don	ninant		
4				Species Across All S	trata: _		(B)
O II (OL LOL (DL) 15 Et radius	0	= Total Co	over	Percent of Dominant			
Sapling/Shrub Stratum (Plot size: 15 Ft radius) 1. Salix exigua	10	Υ	FACW	That Are OBL, FACV	V, or FAC: _		(A/B)
**-				Prevalence Index w	orksheet:		
2				Total % Cover o	<u>f: </u>	Multiply by:	_
4				OBL species	x 1 =	=	_
5				FACW species	x 2 =	=	_
	10	= Total Co	over	FAC species	x 3 =	=	_
Herb Stratum (Plot size: 5 Ft radius)				FACU species	x 4 =	=	_
1. Typha angustifolia		Υ	OBL		x 5 =		
2				Column Totals: 0	(A)	0	_ (B)
3				Prevalence Ind	ex = B/A = _		
4		-		Hydrophytic Vegeta			
5				X 1 - Rapid Test fo	or Hydrophytic	Vegetation	
6				2 - Dominance T	est is >50%	OBL.	
7 8				3 - Prevalence Ir	ndex is ≤3.0 ¹		
9.				4 - Morphologica			
10				data in Rema	rks or on a se		
		= Total Co	over			, ,	,
Woody Vine Stratum (Plot size:) 1				¹ Indicators of hydric s be present, unless di			nust
2				Hydrophytic			
		= Total Co	over	Vegetation	Vaa X	Na	
% Bare Ground in Herb Stratum 0]	Yes <u>X</u>		
Remarks:	D5 - FAC Neut	tral Test for hydr	ology. Drop all FAC,	cross examine all other dominants. I	f > 50% remaining are	FACW to OBL, then	YES to D5.

US Army Corps of Engineers Great Plains – Version 2.0

SOIL Sampling Point: SP-10

Profile Desc	cription: (Describ	e to the dep	th needed to docu	ment the	indicator	or confirm	m the absence	of indicators.)
Depth	Matrix		Redo	x Feature	es			
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	<u>Texture</u>	Remarks
0-10	10 YR 2/1	100					loam	organic matter muck (lots)
10-18	10 YR 3/3	95	10 YR 4/6	5	С	М	sandy clay loam	redox
			-	_				
	-			_			· 	
			-					
			·-	_				
1 _{Type:} C=C	oncontration D-Da	nlotion DM	-Boducod Matrix C	S=Covere	d or Coote	d Sand C	troing 2l oc	nation: DI =Doro Lining M=Matrix
			=Reduced Matrix, C: LRRs, unless othe			ea Sana G		tation: PL=Pore Lining, M=Matrix. for Problematic Hydric Soils ³ :
Histosol		cable to all						•
	pipedon (A2)		Sandy	Redox (S				Muck (A9) (LRR I, J) Prairie Redox (A16) (LRR F, G, H)
	istic (A3)			d Matrix (urface (S7) (LRR G)
	en Sulfide (A4)			`	ineral (F1)			lains Depressions (F16)
	d Layers (A5) (LRR	(F)			latrix (F2)		-	R H outside of MLRA 72 & 73)
<u>х</u> 1 cm Ми	uck (A9) (LRR F, G	, H)	Deplete	ed Matrix	(F3)		Reduc	ed Vertic (F18)
Depleted	d Below Dark Surfa	ice (A11)	Redox	Dark Surf	ace (F6)			arent Material (TF2)
	ark Surface (A12)				urface (F7)		hallow Dark Surface (TF12)
-	Mucky Mineral (S1)	(00) (LDD		Depression	. ,	(4.0)		(Explain in Remarks)
	Mucky Peat or Peat ucky Peat or Peat (essions (F	,		of hydrophytic vegetation and d hydrology must be present,
5 CIII IVIC	icky real of real (55) (LKK F)	(IAIT	.KA 12 0.	73 OI LKN	(П)		disturbed or problematic.
Restrictive	Layer (if present):							distarbed of problematic.
Type:								
1 —	ches):						Hydric Soil	Present? Yes X No
Remarks:	<u> </u>						ya.io ooii	- 1000iii. 100 <u></u> 110 <u></u>
	pery/oily betwee	n finaers =	muck					
			e of hydric soil pre	sent.				
HYDROLO	GY							
Wetland Hy	drology Indicators	s:						
_			d; check all that app	ly)			Seconda	ry Indicators (minimum of two required)
Surface	Water (A1)	-	Salt Crust	(B11)			Surf	ace Soil Cracks (B6)
	ater Table (A2)		Aquatic In		es (B13)			rsely Vegetated Concave Surface (B8)
X Saturation	,		Hydrogen					nage Patterns (B10)
Water M			Dry-Seaso)		lized Rhizospheres on Living Roots (C3)
·	nt Deposits (B2)		Oxidized					here tilled)
	posits (B3)		(where	not tilled)	-	Cray	rfish Burrows (C8)
	at or Crust (B4)		Presence	of Reduc	ed Iron (C	4)	Satu	ration Visible on Aerial Imagery (C9)
Iron Dep	posits (B5)		X Thin Muck	c Surface	(C7)		X Geo	morphic Position (D2)
Inundati	on Visible on Aeria	l Imagery (B	7) Other (Ex	plain in R	emarks)		FAC	-Neutral Test (D5)
Water-S	tained Leaves (B9))					Fros	t-Heave Hummocks (D7) (LRR F)
Field Obser	vations:							
Surface Wat	er Present?	Yes	No X Depth (in	iches):				
Water Table			No X Depth (in					
Saturation P			No Depth (in				land Hydrology	y Present? Yes x No No
(includes car	oillary fringe)							<u> </u>
Describe Re	corded Data (strea	m gauge, m	onitoring well, aerial	photos, p	revious ins	spections),	, if available:	
Remarks:								
Evidence of	wetland hydrolo	gy is satura	ation at the surface	э.				
ĺ								

Project/Site: I-70 Bridge Over Havana Street		City/County: Denver		Sampling Date: 4-12-13
Applicant/Owner: CDOT	_		State: CO	
Investigator(s): E. Weber, S. Fanello			nge: Section 23, Township	
				Slope (%): 0
Subregion (LRR): G- Western Great Plains		,	,	
			NWI classifica	
Are climatic / hydrologic conditions on the site typical for				
Are Vegetation, Soil, or Hydrology				
Are Vegetation, Soil, or Hydrology			eeded, explain any answer	
SUMMARY OF FINDINGS – Attach site ma				
Hydrophytic Vegetation Present? Yes X	No	Is the Sampled	Area	
Hydric Soil Present? Yes X	No	within a Wetlar		No
Wetland Hydrology Present? Yes X Remarks:	No			
Sampling point completed in ditch/swale along In VEGETATION – Use scientific names of pl	ants.			
Tree Stratum (Plot size: 30 Ft radius)	Absolute % Cover	Dominant Indicator Species? Status	Dominance Test works	
1			Number of Dominant Sp That Are OBL, FACW, o	
2.			(excluding FAC-):	(A)
3			Total Number of Domina	ant
4			Species Across All Strat	a: (B)
Sapling/Shrub Stratum (Plot size: 15 Ft radius)	0	= Total Cover	Percent of Dominant Sp	
Saping/Shrub Stratum (Plot size: 10 + thadids)	20	Y FACW	That Are OBL, FACW, o	r FAC: (A/B)
2			Prevalence Index work	sheet:
3.				Multiply by:
4.				x 1 =
5.				x 2 =
		= Total Cover		x 3 =
Herb Stratum (Plot size: 5 Ft radius) 1 Phalaris arundinacea		Y FACW	FACU species	
				x 5 = (A) 0 (B)
2. 3.			Column Totals.	(A) <u>-</u> (B)
4			Prevalence Index	= B/A =
5.			Hydrophytic Vegetatio	
6.			X 1 - Rapid Test for H All dominar 2 - Dominance Test	ydrophytic Vegetation ts are FACW and/or OBL.
7				
8			3 - Prevalence Inde	x is ≤3.0° daptations¹ (Provide supporting
9			data in Remarks	or on a separate sheet)
10			Problematic Hydrop	hytic Vegetation ¹ (Explain)
Woody Vine Stratum (Plot size:)		= Total Cover	¹ Indicators of hydric soil be present, unless distu	and wetland hydrology must rbed or problematic.
1 2			Hydrophytic	
% Bare Ground in Herb Stratum 0		= Total Cover	Vegetation	s <u>× No</u>
Remarks:	D5 - FAC Neu	tral Test for hydrology. Drop all FAC,	cross examine all other dominants. If > 50	0% remaining are FACW to OBL, then YES to D5.
Scrub/shrub wetland				

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SOIL Sampling Point: SP-3

Depth	Matrix		R	ledox Feature			m the absence	
(inches)	Color (moist)	%	Color (moist)		Type ¹	Loc ²	Texture	Remarks
0-6	10 YR 2/1	100					sandy clay loam	mucky at surface, no redox
6-10	10 YR 3/2	100	·				sand	no redox
10-18	10 YR 3/2	98	7.5 YR 4/6	2	C	PL	sandy loam	redox features present
Hydric Soi Histoso Histic E Black H Hydrog Stratifie 1 cm M	Epipedon (A2) Histic (A3) Jen Sulfide (A4) Jed Layers (A5) (LRR Juck (A9) (LRR F, G	icable to a R F) , H)	LRRs, unless o	therwise no dy Gleyed M dy Redox (S oped Matrix (my Mucky M my Gleyed M oleted Matrix	ted.) (atrix (S4) (5) (S6) (ineral (F1) (Iatrix (F2) (F3)	ed Sand G	Indicators 1 cm N Coast Dark S High F (LF	cation: PL=Pore Lining, M=Matrix. for Problematic Hydric Soils ³ : Muck (A9) (LRR I, J) Prairie Redox (A16) (LRR F, G, H) Surface (S7) (LRR G) Plains Depressions (F16) RR H outside of MLRA 72 & 73) sed Vertic (F18)
Thick I Sandy 2.5 cm 5 cm M	ed Below Dark Surfa Dark Surface (A12) Mucky Mineral (S1) Mucky Peat or Peat lucky Peat or Peat (t (S2) (LRR S3) (LRR F	Dep Red 2 G, H) High	lox Dark Surfoleted Dark S lox Depression h Plains Depression (MLRA 72 &	urface (F7) ons (F8) ressions (F	16)	Very S Other ³ Indicators wetland	arent Material (TF2) Shallow Dark Surface (TF12) (Explain in Remarks) of hydrophytic vegetation and d hydrology must be present, disturbed or problematic.
Restrictive	Layer (if present):							
Type:								
								D 10 1/ V
	nches):						Hydric Soil	Present? Yes X No No
Remarks: Same hyd	ric indicators as S	P-1					Hydric Soil	Present? Yes ^ No
Remarks: Same hyd	ric indicators as S						Hydric Soil	Present? Yes ^ No
Remarks: Same hyd HYDROLO Wetland H	ric indicators as S OGY ydrology Indicators	s:						
Remarks: Same hyde HYDROLO Wetland Heart Primary India	ric indicators as S OGY ydrology Indicators licators (minimum of	s:					Seconda	ary Indicators (minimum of two required
Remarks: Same hyd HYDROLO Wetland Hydrimary Ind Surface	DGY ydrology Indicators icators (minimum of	s:	Salt Cı	rust (B11)	(0.40)		Seconda Suri	ary Indicators (minimum of two required face Soil Cracks (B6)
Remarks: Same hyde HYDROLO Wetland Hi Primary Ind Surface High W	DGY ydrology Indicators licators (minimum of e Water (A1) //ater Table (A2)	s:	Salt Cı Aquati	rust (B11) c Invertebrat			Seconda Suri Spa	ary Indicators (minimum of two required face Soil Cracks (B6) rrsely Vegetated Concave Surface (B8)
Remarks: Same hyd HYDROLO Wetland H Primary Ind Surface High W X Satura	pric indicators as S OGY ydrology Indicators licators (minimum of the Water (A1) /ater Table (A2) tion (A3)	s:	Salt Cı Aquati Hydroo	rust (B11) c Invertebrat gen Sulfide 0	Odor (C1)		Seconda Suri Spa Dra	ary Indicators (minimum of two required face Soil Cracks (B6) irsely Vegetated Concave Surface (B8) inage Patterns (B10)
Remarks: Same hyd HYDROL(Wetland H Primary Ind Surface High W X Satura Water	ric indicators as S OGY ydrology Indicators icators (minimum of e Water (A1) /ater Table (A2) tion (A3) Marks (B1)	s:	Salt Cı Aquati Hydroţ Dry-Se	rust (B11) c Invertebrat gen Sulfide C eason Water	odor (C1) Table (C2)		Seconda Suri Spa Dra Oxid	ary Indicators (minimum of two required face Soil Cracks (B6) irsely Vegetated Concave Surface (B8) inage Patterns (B10) dized Rhizospheres on Living Roots (Ca
Remarks: Same hydromath HYDROLO Wetland High W X Satura Water Sedime	ric indicators as S OGY ydrology Indicators icators (minimum of e Water (A1) /ater Table (A2) tion (A3) Marks (B1) ent Deposits (B2)	s:	Salt Cı Aquati Hydroo Dry-Se Oxidiz	rust (B11) c Invertebrat gen Sulfide C eason Water ed Rhizosph	Odor (C1) Table (C2) eres on Liv		Seconda Suri Spa Dra Oxid (C3)	ary Indicators (minimum of two required face Soil Cracks (B6) arsely Vegetated Concave Surface (B8) arsely Patterns (B10) dized Rhizospheres on Living Roots (Cauthere tilled)
Remarks: Same hydromath HYDROLO Wetland High W X Satura Water Sedime Drift De	pric indicators as S OGY ydrology Indicators icators (minimum of water (A1) /ater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3)	s:	Salt Ci Aquati Hydrog Dry-Se Oxidizo (whe	rust (B11) c Invertebrat gen Sulfide C eason Water ed Rhizosph ere not tilled	Odor (C1) Table (C2) eres on Liv	ing Roots	Seconda Suri Spa Dra Oxio (C3) (w	ary Indicators (minimum of two required face Soil Cracks (B6) arsely Vegetated Concave Surface (B8) inage Patterns (B10) dized Rhizospheres on Living Roots (Carret tilled) yfish Burrows (C8)
HYDROLO Wetland Hi Primary Ind Surface High W X Satura Water Sedime Drift De	pric indicators as S OGY ydrology Indicators icators (minimum of e Water (A1) /ater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) fat or Crust (B4)	s:	Salt Ci Aquati Hydrog Dry-Se Oxidize (whe Preser	rust (B11) ic Invertebrat gen Sulfide C eason Water ed Rhizosph ere not tilled nce of Reduc	Odor (C1) Table (C2) eres on Liv) ed Iron (C4	ing Roots	Seconda Suri Spa Dra Oxio (C3) (w Cra Satu	ary Indicators (minimum of two required face Soil Cracks (B6) Irsely Vegetated Concave Surface (B8) Inage Patterns (B10) Idized Rhizospheres on Living Roots (Concertilled) Indicator Visible on Aerial Imagery (C9)
Remarks: Same hyd HYDROLO Wetland H: Primary Ind Surface High W X Satura: Water Sedime Drift De Algal M Iron De	ric indicators as S OGY ydrology Indicators licators (minimum of e Water (A1) /ater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) /at or Crust (B4) eposits (B5)	s: one requir	Salt Ci Aquati Hydrog Dry-Se Oxidiz: (whe Preser Thin M	rust (B11) c Invertebrat gen Sulfide C eason Water ed Rhizosph ere not tilled	Odor (C1) Table (C2) eres on Liv) ed Iron (C4	ing Roots	Seconda Suri Spa Dra Oxio (C3) (w Cra Satu	ary Indicators (minimum of two required face Soil Cracks (B6) arsely Vegetated Concave Surface (B8) inage Patterns (B10) dized Rhizospheres on Living Roots (Carret tilled) yfish Burrows (C8)
Remarks: Same hyd HYDROLO Wetland H Primary Ind Surface High W X Satura Water Sedime Drift De Algal M Iron De	pric indicators as S OGY ydrology Indicators icators (minimum of e Water (A1) /ater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) fat or Crust (B4)	s: one requir	Salt Ci Aquati Hydroo Dry-Se Oxidiz: (whe Preser Thin M	rust (B11) ic Invertebrat gen Sulfide C eason Water ed Rhizosph ere not tilled nce of Reduc	Odor (C1) Table (C2) eres on Liv) ed Iron (C4 (C7)	ing Roots	Seconda Suri Spa Dra Oxio (W Cra Satu X Geo	ary Indicators (minimum of two required face Soil Cracks (B6) ursely Vegetated Concave Surface (B8) unage Patterns (B10) dized Rhizospheres on Living Roots (C: under tilled) urstion Visible on Aerial Imagery (C9)
Remarks: Same hydi HYDROL(Wetland H Primary Ind Surface High W X Satura Water Sedime Drift De Algal M Iron De Inunda	ric indicators as S OGY ydrology Indicators licators (minimum of e Water (A1) /ater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) /at or Crust (B4) eposits (B5)	s: one requir	Salt Ci Aquati Hydroo Dry-Se Oxidiz: (whe Preser Thin M	rust (B11) c Invertebrat gen Sulfide C eason Water ed Rhizosph ere not tilled nce of Reduc fuck Surface	Odor (C1) Table (C2) eres on Liv) ed Iron (C4 (C7)	ing Roots	Seconda Suri Spa Dra Oxid (C3) (w Cra Satu X Gec X FAC	ary Indicators (minimum of two required face Soil Cracks (B6) ursely Vegetated Concave Surface (B8) inage Patterns (B10) dized Rhizospheres on Living Roots (Contere tilled) urfish Burrows (C8) uration Visible on Aerial Imagery (C9) unorphic Position (D2)
Remarks: Same hydi HYDROLO Wetland H Primary Ind Surface High W X Satura Water Sedime Drift De Algal M Iron De Inunda	ric indicators as S OGY ydrology Indicators icators (minimum of e Water (A1) /ater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) flat or Crust (B4) eposits (B5) tion Visible on Aeria Stained Leaves (B9)	s: one requir	Salt Ci Aquati Hydroo Dry-Se Oxidiz: (whe Preser Thin M	rust (B11) c Invertebrat gen Sulfide C eason Water ed Rhizosph ere not tilled nce of Reduc fuck Surface	Odor (C1) Table (C2) eres on Liv) ed Iron (C4 (C7)	ing Roots	Seconda Suri Spa Dra Oxid (C3) (w Cra Satu X Gec X FAC	ary Indicators (minimum of two required face Soil Cracks (B6) Irsely Vegetated Concave Surface (B8) Inage Patterns (B10) Idized Rhizospheres on Living Roots (Carlet tilled) Ingrish Burrows (C8) Ingrish Surrows (C8) Ingrish Surrows (C8) Ingrish Position (D2) Incomplic Position (D2) Incomplic Position (D5)
HYDROLO Wetland H Primary Ind Surface High W X Satura Water Sedime Drift De Algal M Iron De Inunda Water- Field Obse	pric indicators as S OGY ydrology Indicators dicators (minimum of the Water (A1) dater Table (A2) dion (A3) Marks (B1) ent Deposits (B2) deposits (B3) dat or Crust (B4) deposits (B5) tion Visible on Aeria Stained Leaves (B9) divations: dater Present?	s: Tone requir I Imagery (I	Salt Ci Aquati Hydrog Dry-Se Oxidize (whe Preser Thin M B7) Other of	rust (B11) c Invertebrat gen Sulfide C eason Water ed Rhizosph ere not tilled nce of Reduc fluck Surface (Explain in R	Odor (C1) Table (C2) eres on Liv) ed Iron (C4 (C7) emarks)	ing Roots	Seconda 	ary Indicators (minimum of two required face Soil Cracks (B6) Irsely Vegetated Concave Surface (B8) Inage Patterns (B10) Idized Rhizospheres on Living Roots (Carlet tilled) Ingrish Burrows (C8) Ingrish Surrows (C8) Ingrish Surrows (C8) Ingrish Position (D2) Incomplic Position (D2) Incomplic Position (D5)
HYDROLO Wetland H Primary Ind Surface High W X Satura Water Sedime Drift De Algal M Iron De Inunda Water- Field Obse	pric indicators as S OGY ydrology Indicators dicators (minimum of the Water (A1) dater Table (A2) dion (A3) Marks (B1) ent Deposits (B2) deposits (B3) dat or Crust (B4) deposits (B5) tion Visible on Aeria Stained Leaves (B9) divations: dater Present?	s: Tone requir I Imagery (I	Salt Ci Aquati Hydrog Dry-Se Oxidize (whe Preser Thin M B7) Other	rust (B11) c Invertebrat gen Sulfide C eason Water ed Rhizosph ere not tilled nce of Reduc fluck Surface (Explain in R	Odor (C1) Table (C2) eres on Liv) ed Iron (C4 (C7) emarks)	ing Roots	Seconda 	ary Indicators (minimum of two required face Soil Cracks (B6) Irsely Vegetated Concave Surface (B8) Inage Patterns (B10) Idized Rhizospheres on Living Roots (Contract tilled) Ingrish Burrows (C8) Ingrish Surrows (C8) Ingrish Surrows (C9) Ingrish Position (D2) Incomplic Position (D2)
Remarks: Same hydromatic hydrologolder Surface High Water Sedime Drift De Inunda Water- Field Obset Surface Water Table Saturation (includes care	ric indicators as S OGY ydrology Indicators icators (minimum of e Water (A1) /ater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) flat or Crust (B4) eposits (B5) tion Visible on Aeria Stained Leaves (B9) ervations: ater Present? e Present?	I Imagery (I) Yes Yes Yes	Salt Ci Aquati Hydrog Dry-Se Oxidiz:	rust (B11) c Invertebrat gen Sulfide C eason Water ed Rhizosph ere not tilled nce of Reduct fluck Surface (Explain in R n (inches): n (inches): n (inches): n (inches): n (inches): n (inches):	Odor (C1) Table (C2) eres on Liv) ed Iron (C4 (C7) emarks)	ing Roots 4) Wet	Seconda Suri Spa Dra Oxio (W Cra Sati X Geo X FAO Fros	ary Indicators (minimum of two required face Soil Cracks (B6) Irsely Vegetated Concave Surface (B8) Inage Patterns (B10) Idized Rhizospheres on Living Roots (Concert tilled) Ingrish Burrows (C8) Ingrish Surrows (C8) Ingrish Surrows (C9) Ingrish Position (D2) Ingrish Position (D2) Ingrish Concerts (D5)
Remarks: Same hydromatic hydrologolder Surface High Water Sedime Drift De Inunda Water- Field Obset Surface Water Table Saturation (includes care	ric indicators as S OGY ydrology Indicators licators (minimum of e Water (A1) /ater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) flat or Crust (B4) eposits (B5) tion Visible on Aeria Stained Leaves (B9) ervations: ater Present? e Present? epillary fringe)	I Imagery (I) Yes Yes Yes	Salt Ci Aquati Hydrog Dry-Se Oxidiz:	rust (B11) c Invertebrat gen Sulfide C eason Water ed Rhizosph ere not tilled nce of Reduct fluck Surface (Explain in R n (inches): n (inches): n (inches): n (inches): n (inches): n (inches):	Odor (C1) Table (C2) eres on Liv) ed Iron (C4 (C7) emarks)	ing Roots 4) Wet	Seconda Suri Spa Dra Oxio (W Cra Sati X Geo X FAO Fros	ary Indicators (minimum of two required face Soil Cracks (B6) ursely Vegetated Concave Surface (B8) dized Rhizospheres on Living Roots (Carlete tilled) urfish Burrows (C8) uration Visible on Aerial Imagery (C9) compression (D2) C-Neutral Test (D5) st-Heave Hummocks (D7) (LRR F)
Remarks: Same hydromatic hydrologolder Wetland Hydrologolder Surface High Water Sedime Drift De Algal Mater Iron De Inunda Water- Field Obse Surface Water Table Saturation of (includes can Describe Reserved)	ric indicators as S OGY ydrology Indicators licators (minimum of e Water (A1) /ater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) flat or Crust (B4) eposits (B5) tion Visible on Aeria Stained Leaves (B9) ervations: ater Present? e Present? epillary fringe)	I Imagery (I) Yes Yes Yes	Salt Ci Aquati Hydrog Dry-Se Oxidiz:	rust (B11) c Invertebrat gen Sulfide C eason Water ed Rhizosph ere not tilled nce of Reduct fluck Surface (Explain in R n (inches): n (inches): n (inches): n (inches): n (inches): n (inches):	Odor (C1) Table (C2) eres on Liv) ed Iron (C4 (C7) emarks)	ing Roots 4) Wet	Seconda Suri Spa Dra Oxio (w Cra Sati X Geo X FAC Fros	ary Indicators (minimum of two required face Soil Cracks (B6) ursely Vegetated Concave Surface (B8) unage Patterns (B10) dized Rhizospheres on Living Roots (Cuhere tilled) urfish Burrows (C8) uration Visible on Aerial Imagery (C9) umorphic Position (D2) C-Neutral Test (D5) st-Heave Hummocks (D7) (LRR F)
Remarks: Same hydromatics Same hydromatics Algal Month of the primary India Surface High Work Saturar Water Sedime Drift De Inunda Water- Field Obset Surface Water Table Saturation (includes candidated to be c	ric indicators as S OGY ydrology Indicators licators (minimum of e Water (A1) /ater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) flat or Crust (B4) eposits (B5) tion Visible on Aeria Stained Leaves (B9) ervations: ater Present? e Present? epillary fringe)	I Imagery (I) Yes Yes _X m gauge, n	Salt Crick	rust (B11) c Invertebrat gen Sulfide C eason Water ed Rhizosph ere not tilled nce of Reduct fluck Surface (Explain in R n (inches): n (inches): n (inches): n (inches): n (inches): n (inches):	Odor (C1) Table (C2) eres on Liv) ed Iron (C4 (C7) emarks)	ing Roots 4) Wet	Seconda Suri Spa Dra Oxio (w Cra Sati X Geo X FAC Fros	ary Indicators (minimum of two required face Soil Cracks (B6) ursely Vegetated Concave Surface (B8) dized Rhizospheres on Living Roots (Context tilled) urstion Visible on Aerial Imagery (C9) uration Visible on Aerial Imagery (C9) uration Position (D2) C-Neutral Test (D5) st-Heave Hummocks (D7) (LRR F)

Project/Site: I-70 Bridge Over Havana Street		City/Co	unty: Den	nver		Sam	pling Date: 4-12	2-13
Applicant/Owner: CDOT					State: CO			
Investigator(s): E. Weber, S. Fanello								
Landform (hillslope, terrace, etc.): N/A								
Subregion (LRR): G- Western Great Plains								
					NWI			
Are climatic / hydrologic conditions on the site typical for th								
Are Vegetation, Soil, or Hydrology	•						,	No
Are Vegetation, Soil, or Hydrology					ded, explain any			_ 140
SUMMARY OF FINDINGS – Attach site map								ures, etc.
Hydrophytic Vegetation Present? Yes X N	No		Is the Sar	mpled A	\rea			
Hydric Soil Present? Yes X	No		within a V	•		es X	No	
Wetland Hydrology Present? Yes X N Remarks:	No							
*Severe drought (http://droughtmonitor.unl.edu) Pit completed in low area in grassy area adjacent to VEGETATION – Use scientific names of plan		d on-ra	amp to I-7	70 from	Havana.			
To Otation (District 30 Ft radius	Absolute		nant Indic		Dominance Te	st worksheet	t:	
Tree Stratum (Plot size: 30 Ft radius	% Cover				Number of Dom That Are OBL, I			
1					(excluding FAC			(A)
3.					Total Number o	f Dominant		
4					Species Across			(B)
Sapling/Shrub Stratum (Plot size: 15 Ft radius)	0				Percent of Dom That Are OBL, I			(A/B)
1								
2					Prevalence Ind		et: Multiply by	<i>,</i> .
3					OBL species			
4					FACW species			
5					FAC species			
Herb Stratum (Plot size: 5 Ft radius)	0	_ = Total	l Cover		FACU species			
1. Typha angustifolia	100	Υ	OBL		•		x 5 =	
2.					Column Totals:			
3.						5		
4	_						Δ =	
5					Hydrophytic Vox. 1 - Rapid T	-		_
6	_				2 - Domina	All dominants are FA	PHYTIC Vegetatio CW and/or OBL. 50%	11
7					3 - Prevale			
8					4 - Morphol			supporting
9		-			data in F	Remarks or o	n a separate she	eet)
10	400				Problemation	c Hydrophytic	Vegetation ¹ (Ex	oplain)
Woody Vine Stratum (Plot size:) 1		=	l Cover		¹ Indicators of hy be present, unle			gy must
2.					Hydrophytic			
% Bare Ground in Herb Stratum 0			l Cover		Vegetation Present?	Yes X	No	_
Remarks:	D5 - FAC Neu	utral Test for	hydrology. Drop	p all FAC, cro	oss examine all other dom	ninants. If > 50% rema	aining are FACW to OBL,	then YES to D5.
Wetland vegetation has been mowed.								

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SOIL Sampling Point: SP-1

Profile Desc	ription: (Describe	to the dep	oth needed to docum	nent the	indicator	or confirm	n the absence	of indicators.)
Depth	Matrix			x Feature				,
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-4	10YR 3/2	100					sandy clay loam	No redox
4-10	10YR 3/2	97	7.5YR 4/6	3	С	PL/M	sandy loam	Redox features observed
10-18	10YR 3/4	100					loamy sand	No redox
	-		-	-				
	-		-		- ——			
			=Reduced Matrix, CS			ed Sand G		cation: PL=Pore Lining, M=Matrix.
Hydric Soil I	ndicators: (Applic	cable to all	LRRs, unless other	wise not	ed.)		Indicators	for Problematic Hydric Soils ³ :
Histosol	` '				atrix (S4)			Muck (A9) (LRR I, J)
	pipedon (A2)			Redox (S				Prairie Redox (A16) (LRR F, G, H)
Black His	` '			Matrix (Surface (S7) (LRR G)
	n Sulfide (A4)				neral (F1)		_	Plains Depressions (F16)
	Layers (A5) (LRR	,		-	atrix (F2)		•	RR H outside of MLRA 72 & 73)
	ck (A9) (LRR F, G,			d Matrix (,			red Vertic (F18)
-	l Below Dark Surfac ark Surface (A12)	Se (ATT)		Dark Surfa	urface (F7)			arent Material (TF2) Shallow Dark Surface (TF12)
	lucky Mineral (S1)			Dark St Depressio		'		(Explain in Remarks)
-	lucky Peat or Peat	(S2) (LRR			essions (F	16)		of hydrophytic vegetation and
	cky Peat or Peat (S				73 of LRR			d hydrology must be present,
<u> </u>	`	, ,	,			,		disturbed or problematic.
Restrictive L	ayer (if present):							
Type:								
Depth (inc	ches):						Hydric Soil	Present? Yes X No No
Remarks:							-	
					below gr	ound sur	face, 6 inches	s in depth, redox observed 3% in
pore linings/	root channels, re	dox conce	entrations prominer	nt.				
HYDROLO	CV.							
		_						
	drology Indicators		de ale a de all de at accel	`			0	
	•	one require	d; check all that apply					ary Indicators (minimum of two required)
	Water (A1)		Salt Crust		(0.40)			face Soil Cracks (B6)
_	ter Table (A2)		Aquatic Inv		, ,			rsely Vegetated Concave Surface (B8)
Saturatio			Hydrogen					inage Patterns (B10)
	arks (B1)		Dry-Seaso					dized Rhizospheres on Living Roots (C3)
	t Deposits (B2)		X Oxidized F			ing Roots	. ,	vhere tilled)
-	oosits (B3)		•	not tilled		4.		yfish Burrows (C8)
_	t or Crust (B4)		Presence		•	+)		uration Visible on Aerial Imagery (C9)
-	osits (B5)	I	Thin Muck					omorphic Position (D2)
	on Visible on Aerial	imagery (B	7) Other (Exp	olain in Re	emarks)			C-Neutral Test (D5)
	tained Leaves (B9)					1	Fros	st-Heave Hummocks (D7) (LRR F)
Field Observ		/os	No X Depth (inc	chac).				
Surface Water								
Water Table			No X Depth (inc				land UsedI	v Present? Ves v
Saturation Pr (includes cap		res	No X Depth (inc	cnes):		_ Wetl	iand Hydrolog	y Present? Yes <u>×</u> No
		n gauge, m	onitoring well, aerial p	ohotos, pi	revious ins	pections),	if available:	
Remarks:								
Surface soil	is moist due to re	ecent snov	vmelt.					

US Army Corps of Engineers Great Plains – Version 2.0

Project/Site: I - 70 EAST	City/County: DE	NVEK Sampling Date: 9/1/2013
Applicant/Owner: _ CDOT		State: CO Sampling Point: 281-01
Investigator(s): ATKINS (MCEUDIUNIE	Section, Township,	Range: <u>523, 735, R67W</u>
Landform (hillslope, terrace, etc.): POADSIDE D	Tre H Local relief (concav	e, convex, none): COAICAVE Slope (%):
		Long: -104.85566707 Datum: WGS
Soil Map Unit Name: Not AVAILABLE		NWI classification: NONE
Are climatic / hydrologic conditions on the site typical for	7/5	
Are Vegetation, Soil, or Hydrology/		re "Normal Circumstances" present? Yes _X No
Are Vegetation		needed, explain any answers in Remarks.)
		t locations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes		14
Hydric Soil Present? Yes	is the sample	ed Area
Wetland Hydrology Present? Yes X		land? YesX No
Remarks: ROADSIDE DITCH ON A		PETERCAL HALMIN C+ ANI)
PEORIA St., PEM, D.	ENDERGE	BETWEEN ITHINK ST. MYD
1 2012111 311 , 1 2101, 21	CPRESSION AL	
CONTROL OF THE CONTRO	100	
/EGETATION – Use scientific names of pla	ants.	
Tree Stratum (Plot size:)	Absolute Dominant Indicato <u>% Cover Species? Status</u>	
1	70 Oover Opecies: Status	Number of Dominant Species That Are OBL, FACW, or FAC
2.		(excluding FAC-):
3.		_ Total Number of Dominant
4		Species Across All Strata: (B)
	= Total Cover	Percent of Dominant Species
Sapling/Shrub Stratum (Plot size:)		That Are OBL, FACW, or FAC:/OO (A/B)
1		Prevalence Index worksheet:
2		Total % Cover of: Multiply by:
3		OBL species x 1 =
5.		FACW species x 2 =
2/	= Total Cover	FAC species x 3 =
Herb Stratum (Plot size: 3) i.A.)	Ha Ves AD.	FACU species x 4 =
1. CAREX NEBRASCENSIS	- 40 YES OBL	
Juneus Ancticus	20 YES FACE	
ECHINOCHION CRUS-GAUI	5 NO FAC	Prevalence Index = B/A =
5. HORDEUM TUBATUM	NO FACU	Hydrophytic Vegetation Indicators:
THE PERSON OF TH		1 - Rapid Test for Hydrophytic Vegetation
· ·		2 - Dominance Test is >50%
1.		3 - Prevalence Index is ≤3.0¹
		4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
0		Problematic Hydrophytic Vegetation¹ (Explain)
	66 = Total Cover	
Voody Vine Stratum (Plot size:)		¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
-	= Total Cover	Hydrophytic Vegetation
6 Bare Ground in Herb Stratum 34		Present? Yes No
Remarks: PENA IN PERACCIPE D	itet. Other Cos	CIES ALVAN FRANK CANNE AT
TEN IN TOURSTIPE D	piller Fret	CIES AWAY FROM SAMPLE PT ATENSE, SCHOENOPLECTUS PUNGTEN
INCUIDE A CANEX Sp. (NO 3)	FINES , TESTUCA PR	ATENSE, SCHOENOPIECTUS PUNGTEN
A		

inches)	Matrix		Redo	x Feature	5			
money,	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-4.	104R 3/1	100					LOAM	
4-12	104R 5/1	60_	7.5 YR 5/6	40	_C_	M,PL	SANDY L	OAM
						<u> </u>		
ydric Soil In	centration, D=Deple		RRs, unless other	wise note	ed.)	d Sand Gra	Indicators for	n: PL=Pore Lining, M=Matrix. Problematic Hydric Soils³:
Black Hist Hydrogen Stratified L 1 cm Mucl Depleted E Thick Dark Sandy Mu 2.5 cm Mu	oedon (A2)) (A11) (2) (LRR G	Sandy F Stripped Loamy I Loamy C Deplete Redox C Redox C Redox C H) High Pla	Gleyed Mar Redox (S5) I Matrix (S Mucky Min Gleyed Ma d Matrix (F Dark Surfact Dark Surfact Depression ins Depression	6) eral (F1) trix (F2) (3) ce (F6) face (F7) s (F8) ssions (F1		Coast Prain Dark Surfa High Plains (LRR H Reduced V Red Paren Very Shalid Other (Exp	(A9) (LRR I, J) rice Redox (A16) (LRR F, G, H) ce (S7) (LRR G) c Depressions (F16) outside of MLRA 72 & 73) fertic (F18) t Material (TF2) www Dark Surface (TF12) lain in Remarks) drophytic vegetation and drology must be present, urbed or problematic.
	yer (if present):							
Type: Depth (inchermarks: Mo	es):	uG Han	- + profile	Ē			Hydric Soil Pres	sent? Yes <u> </u>
Type: Depth (inchermarks: MC	es):	nG Han	- + profile	Ē			Hydric Soil Pres	sent? Yes <u> </u>
DROLOG	Y Ology Indicators: ors (minimum of one		check all that apply)			Secondary In	dicators (minimum of two required
DROLOGietland Hydromary Indicate Saturation Water Mark Sediment E Drift Depos Inundation Water-Stain	y plogy Indicators: ors (minimum of one ater (A1) Table (A2) (A3) (A3) (A3) (A3) (A3) (A3) (A3) (A3	e required;		b) B11) ertebrates Sulfide Odo Water Ta nizosphere of tilled) f Reduced Surface (C	or (C1) ble (C2) es on Livin Iron (C4) 7)	g Roots (C3	Secondary In Surface S Sparsely Drainage X Oxidized (where Crayfish I Saturation FAC-Neu	dicators (minimum of two required Boil Cracks (B6) Vegetated Concave Surface (B8) Patterns (B10) Rhizospheres on Living Roots (C3
DROLOG etland Hydro mary Indicate Surface We High Water Saturation Water Mark Drift Depos Algal Mat o Iron Depos Inundation Water-Stain	y lology Indicators: ors (minimum of one ater (A1) Table (A2) (A3) (A3) (A3) (A5) (A5) (A5) (A5) (A5) (A5) (A5) (A5	e required; agery (B7)	check all that apply Salt Crust (Aquatic Invi Hydrogen S Dry-Seasor Oxidized Ri (where ni Presence oi Thin Muck S Other (Expl.)) B11) ertebrates sulfide Odd i Water Ta nizosphere of tilled) f Reduced Surface (C ain in Rem	or (C1) ble (C2) es on Livin Iron (C4) 7)	g Roots (Ca	Secondary In Surface S Sparsely Drainage X Oxidized (where Crayfish I Saturation FAC-Neu	dicators (minimum of two required Soil Cracks (B6) Vegetated Concave Surface (B8) Patterns (B10) Rhizospheres on Living Roots (C3 tilled) Burrows (C8) In Visible on Aerial Imagery (C9) hic Position (D2) tral Test (D5)
DROLOGietland Hydromary Indicate Saturation Water Mark Sediment L Drift Depos Inundation Water-Stair Id Observat face Water F	y Sology Indicators: ors (minimum of one ater (A1) Table (A2) (A3) Seposits (B2) its (B3) r Crust (B4) its (B5) Visible on Aerial Immed Leaves (B9) ions: Present? Yes	e required; agery (B7)	check all that apply Salt Crust (Aquatic Inv. Hydrogen S Dry-Seasor Oxidized Ri (where ni Presence o' Thin Muck S Other (Expl.)	B11) B11) Britebrates Sulfide Odd in Water Ta hizosphere of tilled) If Reduced Surface (C ain in Rem	or (C1) ble (C2) es on Livin Iron (C4) 7)	g Roots (C3	Secondary In Surface S Sparsely Drainage X Oxidized (where Crayfish I Saturation FAC-Neu	dicators (minimum of two required Soil Cracks (B6) Vegetated Concave Surface (B8) Patterns (B10) Rhizospheres on Living Roots (C3 tilled) Burrows (C8) n Visible on Aerial Imagery (C9) hic Position (D2) tral Test (D5)
DROLOG DROLOG etland Hydro mary Indicate Saturation Water Mark Sediment D Drift Depose Inundation Water-Stair Id Observat face Water F ter Table Presuration Press	y Plotogy Indicators: ors (minimum of one ater (A1) Table (A2) (A3) Openosits (B2) its (B3) or Crust (B4) tts (B5) Visible on Aerial Immed Leaves (B9) Present? Yes esent? Yes eart? Yes	e required; agery (B7)	check all that apply Salt Crust (Aquatic Invi Hydrogen S Dry-Seasor Oxidized Ri (where ni Presence oi Thin Muck S Other (Expl.)	B11) B11) ertebrates Sulfide Odd i Water Ta nizosphere ot tilled) f Reduced Surface (C ain in Rem nes):	or (C1) ble (C2) es on Livin Iron (C4) 7)		Secondary In Surface S Sparsely Drainage Oxidized (where Crayfish I Saturation Geomorp FAC-Neu Frost-Hea	dicators (minimum of two required Soil Cracks (B6) Vegetated Concave Surface (B8) Patterns (B10) Rhizospheres on Living Roots (C3 tilled) Burrows (C8) In Visible on Aerial Imagery (C9) hic Position (D2) tral Test (D5)
DROLOG DROLOG	y Plotogy Indicators: ors (minimum of one ater (A1) Table (A2) (A3) Openosits (B2) its (B3) or Crust (B4) tts (B5) Visible on Aerial Immed Leaves (B9) Present? Yes esent? Yes eart? Yes	e required; agery (B7)	check all that apply Salt Crust (Aquatic Invi Hydrogen S Dry-Seasor Oxidized Ri (where ne Presence oi Thin Muck S Other (Expli) B11) ertebrates sulfide Odd Water Ta nizosphere ot tilled) f Reduced Surface (C Surface (C ain in Rem nes):	or (C1) ble (C2) s on Livin Iron (C4) 7) parks)	Wetland	Secondary in Surface S Sparsec Drainage X Oxidized (where Crayfish I Saturation FAC-Neu Frost-Hea	dicators (minimum of two required Soil Cracks (B6) Vegetated Concave Surface (B8) Patterns (B10) Rhizospheres on Living Roots (C3 tilled) Burrows (C8) n Visible on Aerial Imagery (C9) hic Position (D2) tral Test (D5) ave Hummocks (D7) (LRR F)
DROLOG DROLOG	ology Indicators: ors (minimum of one ater (A1) Table (A2) (A3) (A3) (A3) (A5) (A5) (A5) (A5) (A5) (A7) (A7) (A8) (A8) (A8) (A9) (A9) (A9) (A9) (A9) (A9) (A9) (A9	e required; agery (B7)	check all that apply Salt Crust (Aquatic Invi Hydrogen S Dry-Seasor Oxidized Ri (where ne Presence oi Thin Muck S Other (Expli) B11) ertebrates sulfide Odd Water Ta nizosphere ot tilled) f Reduced Surface (C Surface (C ain in Rem nes):	or (C1) ble (C2) s on Livin Iron (C4) 7) parks)	Wetland	Secondary in Surface S Sparsec Drainage X Oxidized (where Crayfish I Saturation FAC-Neu Frost-Hea	dicators (minimum of two required Soil Cracks (B6) Vegetated Concave Surface (B8) Patterns (B10) Rhizospheres on Living Roots (C: tilled) Burrows (C8) n Visible on Aerial Imagery (C9) hic Position (D2) tral Test (D5) ave Hummocks (D7) (LRR F)

	City/C			Sampling Date: 9/1/20
Applicant/Owner: CDOT	- 1		State:	Sampling Point: 281-04
nvestigator(s): ATKINS (MELIAWN)	Fey / Section	on, Township, R	ange: 523, 73	5, R67W
andform (hillslope, terrace, etc.): ROADSIDE	Dirett Loca	relief (concave	convex, none): CONIC	AVE Slope (%):
Subregion (LRR): LRR G	Lat: <u>39. 7</u>	7487076	Long: -104.8496	7106 Datum: 1165
Soil Map Unit Name: NCT AVAILABLE			NWI classifica	ation: NonE
are climatic / hydrologic conditions on the site typical for	this time of year? Y			
re Vegetation <u>N</u> , Soil <u>N</u> , or Hydrology <u>H</u>			"Normal Circumstances" pr	. /
re Vegetation <u>M</u> , Soil <u>M</u> , or Hydrology <u>M</u>			eeded, explain any answers	
SUMMARY OF FINDINGS – Attach site ma				
ONIMACT OF FINDINGS - Attach site ma	p snowing san	iping point	iocations, transects,	important reatures, et
Hydrophytic Vegetation Present? YesX	No	Is the Sample	d Area	
	No	within a Wetla		No
Wetland Hydrology Present? Yes 🔟				
Remarks: ROADSIDE DITCH NORTH o	F WB ON	RAMP TI	Rem PECKIA or	170.
EGETATION – Use scientific names of pla	ints.			
2 ⁴ 22 V 820 A		inant Indicator	Dominance Test works	heet:
Tree Stratum (Plot size:)	% Cover Spec	cies? Status	Number of Dominant Spe	
<u> </u>			That Are OBL, FACW, or (excluding FAC-):	FAC (A)
3.				
s			Total Number of Dominar Species Across All Strata	
	= Tota	l Cover		
Sapling/Shrub Stratum (Plot size:)		0010.	Percent of Dominant Spe That Are OBL, FACW, or	
			Prevalence Index works	beet
2.				Multiply by:
			47.4.4	x1= 40
			FACW species	x 2 =
	= Tota	I Cover	FAC species	x3= 30
lerb Stratum (Plot size: 3 fq. DiA)			FACU species/ 5	_ x4= _60
. Typtha ANGUSTIFOLIA		ES OBL	UPL species	x 5 =
		10 FAC	Column Totals:6 S	(A) <u>/30</u> (B)
PASCOPYRUM SMITHII	_15% YE	S FACU	Prevalence Index =	P/A - 2 M
			Hydrophytic Vegetation	
			1 - Rapid Test for Hyd	
	2000-		2 - Dominance Test is	
			3 - Prevalence Index	
			4 - Morphological Ada	ptations1 (Provide supporting
),				r on a separate sheet)
***		Cover	Problematic Hydrophy	tic Vegetation¹ (Explain)
loody Vine Stratum (Plot size:)		(50) (50)	¹ Indicators of hydric soil ar	nd wetland hydrology must
			be present, unless disturb	ed or problematic.
			Hydrophytic	
25	= Total	Cover	Vegetation Present? Yes	X No
Bare Ground in Herb Stratum				
Bare Ground in Herb Stratum 5 >	111.00-			
AND DESCRIPTION OF THE PROPERTY OF THE PROPERT				

Onle Desc	cription: (Describe	to the depth n			dicator o	or confirm	n the absence	of indicators.)	
Depth	Matrix			Features	- 1	. 2		<u>_</u>	
(inches)	Color (moist)		Color (moist)		Type¹	Loc²	Texture		narks
()-16	10YR 2/2	98 =	7.5 YR 416			PL	LOAMY	514-1/1)	
					_				
					_				
					_				
	oncentration, D=Dep					d Sand Gr		ation: PL=Pore Lin	_
	ndicators: (Applica	able to all LRR			7.7-25			or Problematic H	
Histosol			10	eyed Matrix	x (S4)			uck (A9) (LRR I, J)	
	ipedon (A2)		∠ Sandy Re					rairie Redox (A16)	Control of the contro
Black His	n Sulfide (A4)			Matrix (S6) ucky Minera				rface (S7) (LRR (1. Table 10. 1
	Layers (A5) (LRR F	n		eyed Matrix	777			ains Depressions (R H outside of ML	
	ck (A9) (LRR F, G, F			Matrix (F3)	100			d Vertic (F18)	KA 12 & 13)
	Below Dark Surface			ark Surface				rent Material (TF2)	
Thick Da	rk Surface (A12)	A. & GOORES		Dark Surfa				allow Dark Surface	
_ Sandy M	ucky Mineral (S1)		Redox De	pressions ((F8)			xplain in Remarks	
_ 2.5 cm M	ucky Peat or Peat (S	62) (LRR G, H)	High Plair	ns Depressi	ions (F1	6)	3Indicators o	f hydrophytic vege	tation and
_ 5 cm Mud	cky Peat or Peat (S3) (LRR F)	(MLR	A 72 & 73 c	of LRR	H)		hydrology must be	
							unless	isturbed or probler	matic.
							unicas u	o. p. co	
Restrictive L	ayer (if present):				1.01		Unicss C		
Restrictive L	ayer (if present):				1000		uness		
_					Dire		Hydric Soil P		X No
Type: Depth (incl Remarks: YDROLOG	nes):	e required; che	ck all that apply)				Hydric Soil F		X No
Type: Depth (incl Remarks: /DROLOG	SY rology Indicators: tlors (minimum of on	e required; chec	ck all that apply)	11)			Hydric Soil F	resent? Yes_	No
Type: Depth (incl Remarks: /DROLOG /etland Hydr rimary Indica _ Surface V	SY rology Indicators: tlors (minimum of on	e required; chec		J. 1980	313)		Hydric Soil F	resent? Yes	No
Type: Depth (incl emarks: /DROLOG /etland Hydrimary Indica _ Surface V	rology Indicators: tors (minimum of on Vater (A1) er Table (A2)	e required; chec	Salt Crust (B	tebrates (B	U113070		Hydric Soil F	resent? Yes	um of two required
Type: Depth (incl Remarks: /DROLOG /etland Hydr rimary Indica Surface W High Wate	rology Indicators: tors (minimum of on Vater (A1) er Table (A2)	e required; chec	Salt Crust (B Aquatic Inver	tebrates (B	(C1)		Secondary Surfac Spars Draina	resent? Yes	um of two required
Type:	rology Indicators: tors (minimum of on Vater (A1) er Table (A2)	-	Salt Crust (B Aquatic Inver Hydrogen Su	tebrates (B Ifide Odor (Water.Table	(C1) e (C2)	g Roots ((Secondary Surface Sparse Draina Oxidiz	resent? Yes	um of two required
Type:	rology Indicators: tors (minimum of on vater (A1) er Table (A2) (A3) rks (B1) Deposits (B2)	-	Salt Crust (B Aquatic Inver Hydrogen Su Dry-Season \	tebrates (B lifide Odor (Water.Table zospheres ((C1) e (C2)	g Roots ((Secondary Surface Spars Draina Oxidiz Oxidiz	resent? Yes	um of two required
Type:	rology Indicators: tors (minimum of on vater (A1) er Table (A2) (A3) rks (B1) Deposits (B2)	-	Salt Crust (B Aquatic Inver Hydrogen Su Dry-Season \ Cyddized Rhiz	tebrates (B lfide Odor (Water.Table zospheres (tilled)	(C1) e (C2) on Living	g Roots ((Secondary Surfac Sparse Draine Oxidiz C3) (whe	Indicators (minimales Soil Cracks (B6) ed Patterns (B10) ed Rhizospheres core tilled)	um of two required cave Surface (B8)
Type:	rology Indicators: tors (minimum of on Vater (A1) er Table (A2) of (A3) The (A3) Deposits (B2) sits (B3) or Crust (B4)	-	Salt Crust (B Aquatic Inver Hydrogen Su Dry-Season \ Oxidized Rhii	tebrates (B ilfide Odor (Water.Table zospheres (tilled) Reduced Iro	(C1) e (C2) on Living on (C4)	g Roots ((Secondary Surfac Surfac Spars Draina Oxidiz C3) (whe	r Indicators (minimale Soil Cracks (B6) ely Vegetated Conge Patterns (B10) ed Rhizospheres core tilled)	um of two required cave Surface (B8) on Living Roots (C
Type:	rology Indicators: tors (minimum of on Vater (A1) er Table (A2) of (A3) The (A3) Deposits (B2) sits (B3) or Crust (B4)	- - - - -	Salt Crust (B Aquatic Inver Hydrogen Su Dry-Season \ Oxidized Rhiz (where not Presence of f	tebrates (B lifide Odor (Water Table zospheres of tilled) Reduced Iro urface (C7)	(C1) e (C2) on Living on (C4)	g Roots (G	Secondary Surfac Surfac Spars Draina Oxidiz C3) (whe Crayfic Satura Geom	r Indicators (minim the Soil Cracks (B6) eley Vegetated Conge Patterns (B10) ed Rhizospheres of the Burrows (C8) tion Visible on Aer orphic Position (D2	um of two required cave Surface (B8) on Living Roots (C
Type:	rology Indicators: tors (minimum of on Vater (A1) er Table (A2) er (A3) roks (B1) Deposits (B2) sits (B3) or Crust (B4) sits (B5)	- - - - -	Salt Crust (B Aquatic Inver Hydrogen Su Dry-Season \ Oxidized Rhiz (where not Presence of I Thin Muck Su	tebrates (B lifide Odor (Water Table zospheres of tilled) Reduced Iro urface (C7)	(C1) e (C2) on Living on (C4)	g Roots (G	Secondary Surfac Spars Draina Oxidac Crayfic Satura Geom	rindicators (minim the Soil Cracks (B6) ely Vegetated Con ge Patterns (B10) ed Rhizospheres of the Burrows (C8) tion Visible on Aer orphic Position (D2 leutral Test (D5)	um of two required cave Surface (B8) on Living Roots (C
Type:	rology Indicators: tors (minimum of on Vater (A1) er Table (A2) f (A3) preposits (B2) sits (B3) or Crust (B4) sits (B5) l Visible on Aerial Im ined Leaves (B9)	- - - - -	Salt Crust (B Aquatic Inver Hydrogen Su Dry-Season \ Oxidized Rhiz (where not Presence of I Thin Muck Su	tebrates (B lifide Odor (Water Table zospheres of tilled) Reduced Iro urface (C7)	(C1) e (C2) on Living on (C4)	g Roots (G	Secondary Surfac Spars Draina Oxidac Crayfic Satura Geom	r Indicators (minim the Soil Cracks (B6) eley Vegetated Conge Patterns (B10) ed Rhizospheres of the Burrows (C8) tion Visible on Aer orphic Position (D2	um of two required cave Surface (B8) on Living Roots (C
Type:	rology Indicators: Iters (minimum of on Vater (A1) Far Table (A2) (A3) (A3) Triks (B1) Deposits (B2) Sits (B3) For Crust (B4) Sits (B5) Visible on Aerial Im Ined Leaves (B9) tions:	agery (B7)	Salt Crust (B Aquatic Inver Hydrogen Su Dry-Season \ Oxidized Rhiz (where not Presence of F Thin Muck Su Other (Explain	tebrates (Bilfide Odor (Water Table zospheres of tilled) Reduced Iro urface (C7) n in Remark	(C1) e (C2) on Living on (C4)	g Roots (C	Secondary Surfac Spars Draina Oxidac Crayfic Satura Geom	rindicators (minim the Soil Cracks (B6) ely Vegetated Con ge Patterns (B10) ed Rhizospheres of the Burrows (C8) tion Visible on Aer orphic Position (D2 leutral Test (D5)	um of two required cave Surface (B8) on Living Roots (C
Type:	rology Indicators: stors (minimum of on Vater (A1) er Table (A2) f (A3) roks (B1) Deposits (B2) sits (B3) or Crust (B4) sits (B5) Visible on Aerial Im ined Leaves (B9) tions: Present? Yes	agery (B7)	Salt Crust (B Aquatic Inver Hydrogen Su Dry-Season \ Oxidized Rhiz (where not Presence of i Thin Muck Su Other (Explai	tebrates (Biffide Odor (Water Table zospheres of tilled) Reduced Irourface (C7) In in Remarkes):	(C1) e (C2) on Living on (C4)	g Roots (G	Secondary Surfac Spars Draina Oxidac Crayfic Satura Geom	rindicators (minim the Soil Cracks (B6) ely Vegetated Con ge Patterns (B10) ed Rhizospheres of the Burrows (C8) tion Visible on Aer orphic Position (D2 leutral Test (D5)	um of two required cave Surface (B8) on Living Roots (C
Type:	rology Indicators: tors (minimum of on Vater (A1) er Table (A2) (A3) rks (B1) Deposits (B2) sits (B3) or Crust (B4) sits (B5) Visible on Aerial Im ined Leaves (B9) tions: Present? Yes event? Yes	agery (B7)	Salt Crust (B Aquatic Inver Hydrogen Su Dry-Season \ Oxidized Rhiz (where not Presence of F Thin Muck Su Other (Explain	tebrates (Biffide Odor (Water Table zospheres of tilled) Reduced Irourface (C7) In in Remark	(C1) e (C2) on Living on (C4)		Secondary Surfac Spars Draina Oxidia Crayfic Satura Secondary Geom FAC-N Frost-H	rindicators (minim the Soil Cracks (B6) ely Vegetated Con ge Patterns (B10) ed Rhizospheres of the Burrows (C8) tion Visible on Aer orphic Position (D2 leutral Test (D5)	um of two required cave Surface (B8) on Living Roots (C ial Imagery (C9) (D7) (LRR F)
Type:	rology Indicators: tors (minimum of on Vater (A1) er Table (A2) (A3) rks (B1) Deposits (B2) sits (B3) or Crust (B4) sits (B5) Visible on Aerial Im ined Leaves (B9) tions: Present? Yes event? Yes	agery (B7)	Salt Crust (B Aquatic Inver Hydrogen Su Dry-Season N Oxidized Rhiz (where not Presence of f Thin Muck Su Other (Explai	tebrates (Biffide Odor (Water.Table zospheres of tilled) Reduced Irrurface (C7) n in Remarks:	(C1) e (C2) on Living on (C4)	Wetlar	Secondary Surfac Sparse Oxidiz C3) (who Crayfic Satura Geom FAC-N Frost-I	rindicators (minim the Soil Cracks (B6) ely Vegetated Con ge Patterns (B10) ed Rhizospheres of the Burrows (C8) tion Visible on Aer orphic Position (D2 leutral Test (D5) Heave Hummocks	um of two required cave Surface (B8) on Living Roots (C ial Imagery (C9) (D7) (LRR F)

Project/Site: 1 - 70 EAST	City/County: _	DENVER Sampling Date: 9/1/76
pplicant/Owner:CDOT		State: Sampling Point: 781-0
vestigator(s): ATKINS (MELDOWN	EV) Section, Town	iship, Range: \$24, 735, \$267W
andform (hillslope, terrace, etc.): DETENHION	Pont D Local relief (c	oncave, convex, none): CONCAVE Slope (%): O
ubregion (LRR): LRR G	Lat: 39.774	Long: -104.8407 Datum: 11165
oil Map Unit Name: Not AVAILABLE		NWI classification:NAPE
e climatic / hydrologic conditions on the site typical for		
e Vegetation		Are "Normal Circumstances" present? Yes X No
e Vegetation/_, Soil/_, or Hydrology	-	(If needed, explain any answers in Remarks.)
		point locations, transects, important features, etc
lydrophytic Vegetation Present? YesX	No	
lydric Soil Present? Yes X	No.	Sampled Area
Vetland Hydrology Present? Yes X		a Wetland? Yes No
emarks: Was T-70 FAST OF S	DEADING C+ Exit	. STORMUNTER DETENTION FACILITY.
	COPIN SI, CAIL	, stopping ex beithering friedlig.
PEM, PSS, PFO.		
GETATION – Use scientific names of pla	ante	
	Absolute Dominant Inc	dicator Dominance Test worksheet:
ee Stratum (Plot size:)	% Cover Species? S	
		That Are OBL, FACW, or FAC (excluding FAC-):
		The second of th
		Total Number of Dominant Species Across All Strata: (B)
		
pling/Shrub Stratum (Plot size:)	= Total Cover	Percent of Dominant Species That Are OBL, FACW, or FAC: (A/B)
		Prevalence Index worksheet:
		Total % Cover of: Multiply by:
		OBL species x 1 =
		FACW species x 2 =
	= Total Cover	FAC species x 3 =
b Stratum (Plot size: 3 Ft. DiA)	- 1-200-1803-5803-584	FACU species x 4 =
JUNICUS ARCTICUS Aloperunus Arundinaceus	50 YES F	ACW UPL species x 5 =
HOPETURUS AMANDINACEUS	_ 50 YES HA	-CW Column Totals: (A) (B)
		Prevalence Index = B/A =
		Hydrophytic Vegetation Indicators:
		∠ 2 - Dominance Test is >50%
		3 - Prevalence Index is ≤3.01
**************************************		4 - Morphological Adaptations¹ (Provide supporting
		data in Remarks or on a separate sheet)
	100 = Total Cover	Problematic Hydrophytic Vegetation ¹ (Explain)
ody Vine Stratum (Plot size:)		¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
	= Total Cover	Hydrophytic Vegetation
are Ground in Herb Stratum		Present? Yes No
narks:		Me used Dec
10% PTO ON DIAGONAL BOUNDS	any At E. END.	Also 10% PSS en HTE E. Banding Acutus. Specifs Listen welle these E point. Great Plains - Version 2.0
-4	/	
IN IS MAINLY TYPHA LATITULA ANIN	SCHIENNAL	No the SORIEC Lietro

rionic bescription. (bescribe to the depth i	needed to document the indicator or	confirm the absence	of indicators.)
Depth Matrix	Redox Features		
	Color (moist) % Type ¹		Remarks
0-12 GIVEN 5/N 100_		5ANDY	COMMA
		/	
	1		
			7
¹ Type: C=Concentration, D=Depletion, RM=Re	duced Matrix, CS=Covered or Coated S	Sand Grains. ² Loc	ation: PL=Pore Lining, M=Matrix.
Hydric Soil Indicators: (Applicable to all LRF	Rs, unless otherwise noted.)		for Problematic Hydric Soils ³ :
Histosol (A1)	Sandy Gleyed Matrix (S4)	1 cm N	luck (A9) (LRR I, J)
Histic Epipedon (A2)	Sandy Redox (S5)		Prairie Redox (A16) (LRR F, G, H)
Black Histic (A3)	Stripped Matrix (S6)		urface (S7) (LRR G)
Hydrogen Sulfide (A4) Stratified Lourse (A5) (LBB 5)	Loamy Mucky Mineral (F1)		ains Depressions (F16)
Stratified Layers (A5) (LRR F) 1 cm Muck (A9) (LRR F, G, H)	_X Loamy Gleyed Matrix (F2) _ Depleted Matrix (F3)		R H outside of MLRA 72 & 73)
Depleted Below Dark Surface (A11)	Redox Dark Surface (F6)		ed Vertic (F18) rent Material (TF2)
Thick Dark Surface (A12)	Depleted Dark Surface (F7)		nallow Dark Surface (TF12)
Sandy Mucky Mineral (S1)	Redox Depressions (F8)		Explain in Remarks)
2.5 cm Mucky Peat or Peat (S2) (LRR G, H)	 High Plains Depressions (F16) 		of hydrophytic vegetation and
_ 5 cm Mucky Peat or Peat (S3) (LRR F)	(MLRA 72 & 73 of LRR H)	wetland	hydrology must be present,
	110000000000000000000000000000000000000	unless	disturbed or problematic.
Restrictive Layer (if present):		A	70.2-
Type:	60		
Depth (inches):		Hydric Soil	Present? Yes No
Remarks:			
remarks:			
kemarks:			
100 to 10			
YDROLOGY			
YDROLOGY Vetland Hydrology Indicators:	ack all that annivi	Secondar	y Indicators (minimum of the constitution
YDROLOGY Vetland Hydrology Indicators: rimary Indicators (minimum of one required; che			y Indicators (minimum of two required
YDROLOGY Vetland Hydrology Indicators: rimary Indicators (minimum of one required; che ≿ Surface Water (A1)	Salt Crust (B11)	Surfa	ce Soil Cracks (B6)
YDROLOGY Vetland Hydrology Indicators: trimary Indicators (minimum of one required; che ∑ Surface Water (A1) ∑ High Water Table (A2)	Salt Crust (B11) Aquatic Invertebrates (B13)	Surfa Spars	ce Soil Cracks (B6) ely Vegetated Concave Surface (B8)
YDROLOGY Vetland Hydrology Indicators: trimary Indicators (minimum of one required; che ∑ Surface Water (A1) ∑ High Water Table (A2) ∑ Saturation (A3)	Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1)	Surfa Spars Drain	ce Soil Cracks (B6) sely Vegetated Concave Surface (B8) age Patterns (B10)
YDROLOGY Vetland Hydrology Indicators: Inimary Indicators (minimum of one required; che Surface Water (A1) ☐ High Water Table (A2) ☐ Saturation (A3) ☐ Water Marks (B1)	Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2)	Surfa Spars Drain Oxidi:	ce Soil Cracks (B6) ely Vegetated Concave Surface (B8) age Patterns (B10) red Rhizospheres on Living Roots (C
YDROLOGY Vetland Hydrology Indicators: rimary Indicators (minimum of one required; che Surface Water (A1) ✓ High Water Table (A2) ✓ Saturation (A3) Water Marks (B1) Sediment Deposits (B2)	Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living F	Surfa Spars Drain Oxidi: Oxidi: Roots (C3) (wh	ce Soil Cracks (B6) sely Vegetated Concave Surface (B8) age Patterns (B10) sed Rhizospheres on Living Roots (C ere tilled)
YDROLOGY Vetland Hydrology Indicators: Inimary Indicators (minimum of one required; che Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3)	Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living f	Surfa Spars Drain Oxidi: Roots (C3)	ce Soil Cracks (B6) sely Vegetated Concave Surface (B8) age Patterns (B10) sed Rhizospheres on Living Roots (Cere tilled) sh Burrows (C8)
YDROLOGY Vetland Hydrology Indicators: Inimary Indicators (minimum of one required; che Surface Water (A1) ✓ High Water Table (A2) ✓ Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4)	Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living F (where not tilled) Presence of Reduced Iron (C4)	Surfa Spars Drain Oxidi: Roots (C3)	ce Soil Cracks (B6) sely Vegetated Concave Surface (B8) age Patterns (B10) sed Rhizospheres on Living Roots (C ere tilled) sh Burrows (C8) ation Visible on Aerial Imagery (C9)
FOROLOGY Vetland Hydrology Indicators: rimary Indicators (minimum of one required; che Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5)	Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living F (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7)	Surfa Spars Drain Oxidi: Roots (C3)	ce Soil Cracks (B6) sely Vegetated Concave Surface (B8) age Patterns (B10) sed Rhizospheres on Living Roots (C ere tilled) sh Burrows (C8) ation Visible on Aerial Imagery (C9) orphic Position (D2)
Vetland Hydrology Indicators: rimary Indicators (minimum of one required; che Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7)	Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living F (where not tilled) Presence of Reduced Iron (C4)	Surfa Spars Drain Oxidi: Roots (C3)	ce Soil Cracks (B6) sely Vegetated Concave Surface (B8) age Patterns (B10) sed Rhizospheres on Living Roots (C ere tilled) sh Burrows (C8) ation Visible on Aerial Imagery (C9) orphic Position (D2) Neutral Test (D5)
YDROLOGY Vetland Hydrology Indicators: rimary Indicators (minimum of one required; che Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9)	Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living F (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7)	Surfa Spars Drain Oxidi: Roots (C3)	ce Soil Cracks (B6) rely Vegetated Concave Surface (B8) age Patterns (B10) red Rhizospheres on Living Roots (Cere tilled) sh Burrows (C8) ation Visible on Aerial Imagery (C9) orphic Position (D2)
YDROLOGY Vettand Hydrology Indicators: rimary Indicators (minimum of one required; che Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9) leld Observations:	Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living f (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7) Other (Explain in Remarks)	Surfa Spars Drain Oxidi: Roots (C3)	ce Soil Cracks (B6) sely Vegetated Concave Surface (B8) age Patterns (B10) sed Rhizospheres on Living Roots (C ere tilled) sh Burrows (C8) ation Visible on Aerial Imagery (C9) orphic Position (D2) Neutral Test (D5)
YDROLOGY Vetland Hydrology Indicators: rimary Indicators (minimum of one required; che Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9) Veld Observations: urface Water Present? Yes	Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living F (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7) Other (Explain in Remarks)	Surfa Spars Drain Oxidi: Roots (C3)	ce Soil Cracks (B6) sely Vegetated Concave Surface (B8) age Patterns (B10) sed Rhizospheres on Living Roots (C ere tilled) sh Burrows (C8) ation Visible on Aerial Imagery (C9) orphic Position (D2) Neutral Test (D5)
Vertand Hydrology Indicators: rimary Indicators (minimum of one required; che Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9) eld Observations: urface Water Present? Yes No ater Table Present? Yes No	Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living f (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7) Other (Explain in Remarks) Depth (inches):	Surfa Spars Drain Oxidi:	ce Soil Cracks (B6) rely Vegetated Concave Surface (B8) age Patterns (B10) red Rhizospheres on Living Roots (C ere tilled) sh Burrows (C8) ation Visible on Aerial Imagery (C9) rophic Position (D2) Neutral Test (D5) Heave Hummocks (D7) (LRR F)
Inundation Visible on Aerial Imagery (B7) Water Table (A2) Sediment Deposits (B2) Drift Deposits (B5) Inundation Visible on Aerial Imagery (B7) Water Stained Leaves (B9) Water Pater (B7) Water Pater (B7) Inundation Visible on Aerial Imagery (B7) Water Stained Leaves (B9) Water Water Present? Yes No ater Table Present?	Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living f (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7) Other (Explain in Remarks) Depth (inches): Depth (inches):	Surfa Spars Spars Drain Oxidia Roots (C3) (wh Satur Geom FAC- Frost-	ce Soil Cracks (B6) sely Vegetated Concave Surface (B8) age Patterns (B10) sed Rhizospheres on Living Roots (Cere tilled) sh Burrows (C8) ation Visible on Aerial Imagery (C9) orphic Position (D2) Neutral Test (D5)

Project/Site: 4 TO EPS	City/	County:	NIVER Sampling Date: 9/1/20
Applicant/Owner: CDOT			State: (0) Sampling Point: 281-0
Investigator(s): ATICING (M'ELDOUAL)	En/) Sect	ion, Township, F	Range: 524, T35 R67W
			e, convex, none): CONTAVE Slope (%): 0
			Long: -/04, 8393220/ Datum:
Soil Map Unit Name: NOT AVAILABLE			NWI classification: NVF
Are climatic / hydrologic conditions on the site typical for			
Are Vegetation			"Normal Circumstances" present? Yes X No
Are Vegetation // Soil // or Hydrology //			
		30	needed, explain any answers in Remarks.) locations, transects, important features, etc
Hydrophytic Vegetation Present? Yes		STREET, SECOND NO.	us on
Hydric Soil Present? Yes		Is the Sample	
Wetland Hydrology Present? Yes		within a Wetla	and? Yes No
Remarks: RIPARIAN AREA IN EAS		e deten	HARV FACILITY.
	(230-20	ninant Indicator	Dominance Test worksheet:
Tree Stratum (Plot size:)	% Cover Spe		Number of Dominant Species
1			That Are OBL, FACW, or FAC (excluding FAC-): (A)
2.	Total Control of the		
3.			Total Number of Dominant Species Across All Strata: 3 (B)
4	= To	al Cavas	(5)
Sapling/Shrub Stratum (Plot size: 70'D/A,)			Percent of Dominant Species That Are OBL, FACW, or FAC: 33% (A/B)
1. PODULUS DECTOIDES (SADGRE	is)_15	YES TAC	
2			r revalence muck worksheet.
8			
			FACW species x 2 =
5			FAC species x 3 =
Herb Stratum (Plot size: 3FT. DiA)	_/= lot	al Cover	FACU species x 4 =
POA COMPRESSA	30 YI	ES FACU	UPL species x 5 =
CONVOLVULUS ARVENISE	_ 10 N	10 ML	Column Totals: (A) (B)
PASCOPYRUM SMITHII	-15 Y	ES FACU	Provolence Index = B/A =
TARAGER OFFICIANTE		lo FACU	Prevalence Index = B/A = Hydrophytic Vegetation Indicators:
•			1 - Rapid Test for Hydrophytic Vegetation
			2 - Dominance Test is >50%
			3 - Prevalence Index is ≤3.0¹
			4 - Morphological Adaptations1 (Provide supporting
0,			data in Remarks or on a separate sheet)
·	55 = Tota	I Cover	Problematic Hydrophytic Vegetation ¹ (Explain)
Voody Vine Stratum (Plot size:)		00101	¹ Indicators of hydric soil and wetland hydrology must
			be present, unless disturbed or problematic.
·	-		Hydrophytic
Bare Ground in Herb Stratum 45	= Tota	l Cover	Present? Yes No
RIPAMIAN AREA			

Sampling Point: 281-076 SOIL Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Redox Features % Color (moist) % Type¹ Loc² Texture Color (moist) (inches) 10 YR 4/2 100 LOAMY SANIS ¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix. Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils3: __ Histosol (A1) __ Sandy Gleyed Matrix (S4) __ 1 cm Muck (A9) (LRR I, J) __ Coast Prairie Redox (A16) (LRR F, G, H) Histic Epipedon (A2) Sandy Redox (S5) __ Black Histic (A3) Stripped Matrix (S6) __ Dark Surface (S7) (LRR G) ___ Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) High Plains Depressions (F16) __ Stratified Layers (A5) (LRR F) __ Loamy Gleyed Matrix (F2) (LRR H outside of MLRA 72 & 73) __ Depleted Matrix (F3) _ 1 cm Muck (A9) (LRR F, G, H) Reduced Vertic (F18) __ Red Parent Material (TF2) Depleted Below Dark Surface (A11) Redox Dark Surface (F6) Thick Dark Surface (A12) Depleted Dark Surface (F7) Very Shallow Dark Surface (TF12) Sandy Mucky Mineral (S1) Redox Depressions (F8) Other (Explain in Remarks) 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) ___ High Plains Depressions (F16) 3Indicators of hydrophytic vegetation and 5 cm Mucky Peat or Peat (S3) (LRR F) (MLRA 72 & 73 of LRR H) wetland hydrology must be present, unless disturbed or problematic. Restrictive Layer (if present): Type: ____ Depth (inches): _ Hydric Soil Present? Yes NO HYDRIC SOIL INDICATORS OBSERVED. **HYDROLOGY** Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) __ Salt Crust (B11) Surface Water (A1) __ Surface Soil Cracks (B6) __ Sparsely Vegetated Concave Surface (B8) ___ Aquatic Invertebrates (B13) High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) Saturation (A3) __ Drainage Patterns (B10) __ Water Marks (B1) ___ Dry-Season Water Table (C2) _ Oxidized Rhizospheres on Living Roots (C3) __ Sediment Deposits (B2) Oxidized Rhizospheres on Living Roots (C3) (where tilled) Drift Deposits (B3) (where not tilled) Crayfish Burrows (C8) ___ Algal Mat or Crust (B4) Presence of Reduced Iron (C4) Saturation Visible on Aerial Imagery (C9) _ Thin Muck Surface (C7) __ Iron Deposits (B5) Geomorphic Position (D2) Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) FAC-Neutral Test (D5) Water-Stained Leaves (B9) Frost-Heave Hummocks (D7) (LRR F) Field Observations: X Depth (inches): Surface Water Present? No Depth (inches): Water Table Present? Yes ____ No __ Depth (inches): _ Saturation Present? Wetland Hydrology Present? Yes _ (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: No WETLAND HYDROLOGY INDICATIONS OBSERVED.

Project/Site: 1 - 40 FAST	City/County:	AMS Sampling Date: 9/1/70
Applicant/Owner:CDOT		State: (O Sampling Point: 787-0
Investigator(s): ATKINS (MCELDOW	NEV) Section, Township.	Range: 519, 735, R66W
Landform (hillslope, terrace, etc.):	Local relief (conces	re, convex, none): CONCAVE Slope (%): </td
Subregion (LRR): LPRG	Lat: 39 77180918	Long: -104.82744069 Datum: W656
		COPE NWI classification: NONE
Are climatic / hydrologic conditions on the site typical for	r this time of year? YesX No	(If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology	significantly disturbed? A	re "Normal Circumstances" present? Yes No
Are Vegetation, Soil, or Hydrology	naturally problematic? (If	needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site m	ap showing sampling poin	t locations, transects, important features, etc
Hydrophytic Vegetation Present? YesX	No Is the Sampl	lad Area
Hydric Soil Present? Yes		land? Yes_X_ No
Wetland Hydrology Present? Yes X Remarks: At INTERSEction OF I	. NO	
/EGETATION – Use scientific names of p	lants.	
Tree Stratum (Plot size:) 1	Absolute Dominant Indicato % Cover Species? Status	Number of Dominant Species That Are OBL, FACW, or FAC
2		(excluding FAC-):
3 4.		Total Number of Dominant Species Across All Strata: (B)
Sapling/Shrub Stratum (Plot size:)	= Total Cover	Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)
1		Prevalence Index worksheet:
2		
3		OBL species x 1 =
1		FACW species x 2 =
5		FAC species x 3 =
Herb Stratum (Plot size: WETGAND)	= Total Cover	FACU species x 4 =
. TVOHA ANGUSTIFOLIA	_ 10 NO OBL	UPL species x 5 =
2. TUDHA LATIFOLIA	45 YES OBL	Column Totals: (A) (B)
. SCHOFNOPLECTUS A CUTUS	2 NO OBL	
ALOPECULUS ARUNDINACEUS	15 NO FACW	Prevalence Index = B/A =
ELEOCHARIS PALUSTRIS	15NOOBL	Hydrophytic Vegetation Indicators:
Rumer Crispus	2 No FAC	1 - Rapid Test for Hydrophytic Vegetation
SCIRPUS PUNGENS		2 - Dominance Test is >50%
ECHINOCHLOA (RUS-GALLI	<1 No FAC	3 - Prevalence Index is ≤3.0¹
SALIX EXIGUA	Z No FACW	4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
O. PHALARIS AMMIDINACEA	2 NO FACW	Problematic Hydrophytic Vegetation¹ (Explain)
Voody Vine Stratum (Plot size:)	= Total Cover	¹ Indicators of hydric soil and wetland hydrology must
		be present, unless disturbed or problematic.
		Hydrophytic
Bare Ground in Herb Stratum	= Total Cover	Vegetation Present? Yes X No
emarks:	*	
Bare Ground in Herb Stratum emarks: PEPLESSIONAL, PEM, 2 PATCHE PEPTOCH LOA FUSCA ALSO OBS. (2) Army Corps of Engineers	S OF PSS, "GROWNI) rower varies in wethard,
PRIOCE OF HUSCA ALSO OBS, (2)	10). v 50%.	
Army Corps of Engineers		Great Plains - Version 2.0

Sampling Point: 282-0/ SOIL Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Redox Features Color (moist) Type¹ Loc² Texture 0-2 10YR 3/1 100 Silty CLAY COAM -6 104R 4/2 95 104R 98 M SANDYloram LOAMY SAND ¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix. Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils3: __ 1 cm Muck (A9) (LRR I, J) Sandy Gleyed Matrix (S4) Histosol (A1) Sandy Redox (S5) Coast Prairie Redox (A16) (LRR F, G, H) Histic Epipedon (A2) Stripped Matrix (S6) __ Black Histic (A3) Dark Surface (S7) (LRR G) Loamy Mucky Mineral (F1) __ High Plains Depressions (F16) __ Hydrogen Sulfide (A4) Stratified Layers (A5) (LRR F) Loamy Gleyed Matrix (F2) (LRR H outside of MLRA 72 & 73) Reduced Vertic (F18) 1 cm Muck (A9) (LRR F, G, H) Depleted Matrix (F3) Depleted Below Dark Surface (A11) Redox Dark Surface (F6) Red Parent Material (TF2) Depleted Dark Surface (F7) Very Shallow Dark Surface (TF12) Thick Dark Surface (A12) Redox Depressions (F8) Sandy Mucky Mineral (S1) Other (Explain in Remarks) __ High Plains Depressions (F16) 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) Indicators of hydrophytic vegetation and 5 cm Mucky Peat or Peat (S3) (LRR F) (MLRA 72 & 73 of LRR H) wetland hydrology must be present, unless disturbed or problematic. Restrictive Layer (if present): Type: ____ Hydric Soil Present? Yes ____ No Depth (inches): Remarks: Soil was moist in 3 and LAYER. SAND GRAINS STAINED IN 3 RD LAYER **HYDROLOGY** Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) __ Salt Crust (B11) X Surface Soil Cracks (B6) Surface Water (A1) ___ Aquatic Invertebrates (B13) Sparsely Vegetated Concave Surface (B8) High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) Saturation (A3) Drainage Patterns (B10) ___ Water Marks (B1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roots (C3) Sediment Deposits (B2) X Oxidized Rhizospheres on Living Roots (C3) (where tilled) Drift Deposits (B3) (where not tilled) Crayfish Burrows (C8) Presence of Reduced Iron (C4) Saturation Visible on Aerial Imagery (C9) ___ Algal Mat or Crust (B4) _ Thin Muck Surface (C7) Iron Deposits (B5) __ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) FAC-Neutral Test (D5) Frost-Heave Hummocks (D7) (LRR F) Water-Stained Leaves (B9) Field Observations: No X Depth (inches): Surface Water Present? Yes ____ No X Depth (inches): Water Table Present? Wetland Hydrology Present? Yes X

Saturation Present?

(includes capillary fringe)

Yes ____ No _ Depth (inches): _

DECENT SIZED RAIN EVENTS.

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: SITE WIN BE INVAIDATED DURING SPINING SNUMBLY ANII) DURING

Project/Site: T - 7-0 EAST	City	County: _ AD	AMS	Sampling Date:9/2/201
Applicant/Owner: CDOF			State:	Sampling Point: 284-01
Investigator(s): ATKINS (MELIDAMA	u€v) Sec	tion, Township, R	lange: 5 29 . 7	35 R66W
Landform (hillslope, terrace, etc.): POADSIDE	DiteH Loc	al relief (concave	, convex, none): Con	VCAVE Slope (%): O
Subregion (LRR): LRR G	Lat: 39,	766872619	Long: -104.79	956 3445 (Datum: U.G. S. 8
Soil Map Unit Name: ASB - ASCALON SANDY	loam 1-3% s	COFS	NWI class	sification: PEM
Are climatic / hydrologic conditions on the site typical f	or this time of year?	Yes X No.	(If no explain i	n Remarks)
Are Vegetation				
Are Vegetation			needed, explain any ans	
SUMMARY OF FINDINGS – Attach site n				
Hydrophytic Vegetation Present? Yes X	_ No			
	_ No	Is the Sample		
Wetland Hydrology Present? Yes >	No	1	nd? Yes	
Remarks: OCCURS IN ROAD RIGHT-O DURING ROAD CONSTRUCTION,	F-WAY WH	hich is Rou	timely mowen	AND WAS DISTURBED
DURING ROAD CONSTRUCTION,	South SIDE O	4 I-70 B	ETWEEN PENIA A	NI AIRPORT RLUDS
DEPRESSIONAL, PEM. PSS O	runs to so	WITH REV	CALLY THE ROW	1 FAICE
VEGETATION - Use scientific names of p		oci i ozy	UNID THE TOP	o revice,
VEGETATION - Use scientific flatfies of p	D. M. C.	minant Indicator	I Bambanas Tast	
Tree Stratum (Plot size:)		ecies? Status	Number of Dominant	a contract to the contract of
1			That Are OBL, FACV	
2.			(excluding FAC-):	/ (A)
3			Total Number of Don	
4			Species Across All S	trata: (B)
Sapling/Shrub Stratum (Plot size:)	= To	tal Cover	Percent of Dominant	Species
1.			That Are OBL, FACV	V, or FAC:
2.			Prevalence Index we	orksheet:
3.				Multiply by:
4				x 1 =
5				x 2 =
	= Tot	al Cover		x 3 =
Herb Stratum (Plot size: / M) 1. ELEOCHARIS PALUSTRIS	75	OBL		x 4 =
2. SCHOENOPLECTUS ACUTUS	5	OBL		x 5 = (A) (B)
3. TYPHA ANGUSTIFOLIA	<u> </u>	OBL	Column Totals.	(A) (B)
4.			Prevalence Inde	x = B/A =
5.			Hydrophytic Vegetat	ion Indicators:
5				Hydrophytic Vegetation
7			1/2 - Dominance Te	
3			3 - Prevalence Inc	TOTAL CONTROL OF THE
			data in Remark	Adaptations ¹ (Provide supporting ks or on a separate sheet)
10				ophytic Vegetation¹ (Explain)
Noody Vine Stratum (Plot size:)	95 = Tota	al Cover	PARTITION AT THE WAY	oil and wetland hydrology must
			be present, unless dis	turbed or problematic.
2			Hydrophytic Vegetation	
6 Bare Ground in Herb Stratum5	= Tota	l Cover		es_X_ No
Remarks: PEM. SITE WAS MOWEL	<u> </u>			
TEMI, THE WAS MOWED	۵.			
		01/2-17-		
Army Corps of Engineers				Great Plaine Version 2.0

	A CONTRACTOR OF THE PARTY OF THE PARTY.	th needed to docum			or confirm	n the absence	of indicators.)
Depth Notice (inches) Color (mo	fatrix oist) %	Color (moist)	Features %	Type ¹	Loc ²	Texture	Remarks
0-1	0100 70	Color (moist)		Type	LOC		MALTER
1 10 100/10 4	12 00	7 5 41 516	20		144 01		
1-10 10/R4	3 80	7.5 YR 5/8	_20		M, PL	SANDY	LAY
1. (21)							
							15. — 15. — 15. — 15. — 15. — 15. — 15. — 15. — 15. — 15. — 15. — 15. — 15. — 15. — 15. — 15. — 15. — 15. — 15
					_		
				-			
						- 2.	
Type: C=Concentration, lydric Soil Indicators: (ed Sand Gr		cation: PL=Pore Lining, M=Matrix. for Problematic Hydric Soils ³ :
Histosol (A1)	Applicable to all	Sandy Gl					fluck (A9) (LRR I, J)
Histic Epipedon (A2)		Sandy Re					Prairie Redox (A16) (LRR F, G, H)
Black Histic (A3)		Stripped					Surface (S7) (LRR G)
Hydrogen Sulfide (A4)		Loamy M		STORY SHAW			lains Depressions (F16)
Stratified Layers (A5)		Loamy G					R H outside of MLRA 72 & 73)
1 cm Muck (A9) (LRR	F, G, H)	Depleted	Matrix (F	3)		Reduc	ed Vertic (F18)
Depleted Below Dark	Surface (A11)	Redox Da	ark Surfac	ce (F6)		Red Pa	arent Material (TF2)
_ Thick Dark Surface (A		Depleted					hallow Dark Surface (TF12)
_ Sandy Mucky Mineral		Redox De			5050		Explain in Remarks)
_ 2.5 cm Mucky Peat or			-				of hydrophytic vegetation and
_ 5 cm Mucky Peat or P	eat (S3) (LRR F)	(MLR	A 72 & 7	3 of LRR	H)		d hydrology must be present,
estrictive Layer (if prese	ent):					uniess	disturbed or problematic.
Туре:	-					Hudric Soil	Procent? Voc X No
Type: Depth (inches):	-					7.0	Present? Yes X No
Type: Depth (inches): emarks: Site Occur	- es in Rosa	Bigitt-of-	way	wHi	CH H	ts BEEn	1 DISTURBED IN THE
Type: Depth (inches): emarks: Site Occur A5t, THE REDO	es IN ROAL	MARIONS AND	WAY	WHI VEG	CH HU	ts BEEn	
Type:	- es in Rosa	MARIONS AND	way OBL	w Hi	CH HA ETALLO	ts BEEn	1 DISTURBED IN THE
Type:	es in Road CONCENTS OME SOILS	MARIONS AND	OBL	WHi VEG	CH HA EtAHÌ	ts BEEn	1 DISTURBED IN THE
Type:	es in Rome CONCENTS PINE SOILS	MAPIONS AND	OBL	WH:	CH HA ETANÒ	AS BEEN NI ANE S	I DISTURBED IN PHE THONGS EVIDENCE THA
Type:	es in Rome CONCENTS PINE SOILS	check all that apply)	OBL	WHi VEG	CH HA ETANÒ	AS BEEN NAME S	A DISTANCE OF IN FIRE
Type:	es in Rome CONCENTS PINE SOILS	check all that apply) Salt Crust (B	108L	VEG	CH H	Secondar Surface Su	THONGS EVIDENCE THAT TO INDICATE THAT TO INDIC
Depth (inches): emarks: Site Occur A5t, THE REDO) SITE HAY 'DROLOGY 'etland Hydrology Indicationary Indicators (minimum Surface Water (A1) High Water Table (A2)	es in Rome CONCENTS PINE SOILS	check all that apply) Salt Crust (B Aquatic Inver	oßL	(B13)	CH M	Seconda Seconda Seconda Surfa Span	THONG EVIDENCE THAT TO Indicators (minimum of two required ace Soil Cracks (B6) sely Vegetated Concave Surface (B8)
Depth (inches): emarks: Site Occur Ast, THE REDO) SITE HAY PROLOGY retland Hydrology Indicators (minimur Surface Water (A1) High Water Table (A2) Saturation (A3)	es in Rome CONCENTS PINE SOILS	check all that apply) Salt Crust (B Aquatic Inver	111) rtebrates	(B13) or (C1)	CH HA	Secondal Surfa Spar Drain	THONGS EVIDENCE THAT TO Indicators (minimum of two required ace Soil Cracks (B6) sely Vegetated Concave Surface (B8) age Patterns (B10)
Depth (inches): emarks: Site Occur Ast, THE REDO) ITE HAY BY OROLOGY Order Hydrology Indicators (minimum Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1)	es in Read CONCENT OME SOILS ators: m of one required;	check all that apply) Salt Crust (B Aquatic Inver Hydrogen Su Dry-Season	11) rtebrates ulfide Odo	(B13) or (C1) ble (C2)	EtALIÒ	Secondal Surfa Spar Drain Oxidi	THONGS EVIDENCE THAT TO Indicators (minimum of two required to Soil Cracks (B6) sely Vegetated Concave Surface (B8) lage Patterns (B10) zed Rhizospheres on Living Roots (City Concave)
Depth (inches): emarks: Site Occur Ast, THE REDO) ITE HAS HAVE PROLOGY Tetland Hydrology Indicators (minimum Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2)	es in Read CONCENT OME SOILS ators: m of one required;	check all that apply) Salt Crust (B Aquatic Inver Hydrogen Su Dry-Season Oxidized Rhi	n11) rtebrates sulfide Odo Water Tal	(B13) or (C1) ble (C2)	EtALIÒ	Secondal Surface Spar Drain Oxidi (wf	ry Indicators (minimum of two required ace Soil Cracks (B6) sely Vegetated Concave Surface (B8) age Patterns (B10) zed Rhizospheres on Living Roots (Carere tilled)
Type:	es in Read CONCENT OME SOILS ators: m of one required;	check all that apply) Salt Crust (B Aquatic Inver Hydrogen Su Dry-Season Oxidized Rhi (where not	n11) rtebrates ulfide Odo Water Tai zosphere t tilled)	(B13) or (C1) ble (C2) s on Livir	EFALLO	Secondal Surfa Spar Drain Oxidi Crayl	ry Indicators (minimum of two required ace Soil Cracks (B6) sely Vegetated Concave Surface (B8) age Patterns (B10) zed Rhizospheres on Living Roots (Cinere tilled) fish Burrows (C8)
Type:	es in Read CONCENT OME SOILS ators: m of one required;	check all that apply) Salt Crust (B Aquatic Inver Hydrogen Su Dry-Season Oxidized Rhi (where not	n11) rtebrates ulfide Odo Water Tai zosphere t tilled) Reduced	(B13) or (C1) ble (C2) s on Livir	EFALLO	Seconda Surfa Spar Drain Oxidi Crayl Satur	ry Indicators (minimum of two required ace Soil Cracks (B6) sale Patterns (B10) ged Rhizospheres on Living Roots (Citere tilled) fish Burrows (C8) ration Visible on Aerial Imagery (C9)
Type:	es IN ROAM CONCENT. DIAZ SOILS intors: m of one required;	check all that apply) Salt Crust (B Aquatic Inver Hydrogen Su Dry-Season Oxidized Rhi (where not Presence of I Thin Muck St	n11) rtebrates ulfide Odo Water Tal zosphere t tilled) Reduced urface (C:	(B13) or (C1) ble (C2) s on Livir	EFALLO	Secondal Surfe Spar Drain Oxidi Crayl Satur Secondal Surfe Spar Crayl Satur Secondal	ry Indicators (minimum of two required to Soil Cracks (B6) sely Vegetated Concave Surface (B8) tage Patterns (B10) zed Rhizospheres on Living Roots (Citere tilled) fish Burrows (C8) ration Visible on Aerial Imagery (C9) morphic Position (D2)
Type:	CONCENTS CONCENTS Mic Soils utors: m of one required;	check all that apply) Salt Crust (B Aquatic Inver Hydrogen Su Dry-Season Oxidized Rhi (where not	n11) rtebrates ulfide Odo Water Tal zosphere t tilled) Reduced urface (C:	(B13) or (C1) ble (C2) s on Livir	EFALLO	Secondal Surfe Spar Oxidi C3) (with Capacitation Secondal Surfe Spar Coxidi C3) (with Capacitation Secondal Secondal	ry Indicators (minimum of two required to Soli Cracks (B6) seld Vegetated Concave Surface (B8) and Patterns (B10) and Roots (Calere tilled) sish Burrows (C8) attorn Visible on Aerial Imagery (C9) morphic Position (D2) Neutral Test (D5)
Type:	CONCENTS CONCENTS Mic Soils utors: m of one required;	check all that apply) Salt Crust (B Aquatic Inver Hydrogen Su Dry-Season Oxidized Rhi (where not Presence of I Thin Muck St	n11) rtebrates ulfide Odo Water Tal zosphere t tilled) Reduced urface (C:	(B13) or (C1) ble (C2) s on Livir	EFALLO	Secondal Surfe Spar Oxidi C3) (with Capacitation Secondal Surfe Spar Coxidi C3) (with Capacitation Secondal Secondal	ry Indicators (minimum of two required to Soil Cracks (B6) sely Vegetated Concave Surface (B8) tage Patterns (B10) zed Rhizospheres on Living Roots (Citere tilled) fish Burrows (C8) ration Visible on Aerial Imagery (C9) morphic Position (D2)
Type:	CONCENTS CONCENTS ONE SOILS ators: m of one required;) erial Imagery (B7) (B9)	check all that apply) Salt Crust (B Aquatic Inver Hydrogen Su Dry-Season Oxidized Rhi (where not Presence of I Thin Muck St Other (Explain	ntl) rtebrates ulfide Odo Water Tai zosphere t tilled) Reduced urface (C:	(B13) or (C1) ble (C2) s on Livir Iron (C4) 7) arks)	EFALLO	Secondal Surfe Spar Oxidi C3) (with Capacitation Secondal Surfe Spar Coxidi C3) (with Capacitation Secondal Secondal	ry Indicators (minimum of two required to Soli Cracks (B6) seld Vegetated Concave Surface (B8) and Patterns (B10) and Roots (Calere tilled) sish Burrows (C8) attorn Visible on Aerial Imagery (C9) morphic Position (D2) Neutral Test (D5)
Type:	erial Imagery (B7) Yes No	check all that apply) Salt Crust (B Aquatic Inver Hydrogen St Dry-Season 1 Oxidized Rhi (where not Presence of I Thin Muck St Other (Explain	ntebrates alfide Odo Water Tai zosphere t tilled) Reduced urface (C: in in Rem	(B13) or (C1) ble (C2) s on Livir Iron (C4) 7) arks)	EFALLO	Secondal Surfe Spar Oxidi C3) (with Capacitation Secondal Surfe Spar Coxidi C3) (with Capacitation Secondal Secondal	ry Indicators (minimum of two required to Soli Cracks (B6) seld Vegetated Concave Surface (B8) and Patterns (B10) and Roots (Calere tilled) sish Burrows (C8) attorn Visible on Aerial Imagery (C9) morphic Position (D2) Neutral Test (D5)
Depth (inches): emarks: Site OCCUM AST, THE REDO) FOROLOGY Fetland Hydrology Indication (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Au Water-Stained Leaves (eld Observations: Irface Water Present?	erial Imagery (B7) Yes No.	check all that apply) Salt Crust (B Aquatic Inver Hydrogen Su Dry-Season 1 Oxidized Rhi (where not Presence of Thin Muck St Other (Explain	ntebrates ulfide Odowater Tai zosphere t tilled) Reduced urface (Cin in Rem	(B13) or (C1) ble (C2) s on Livir Iron (C4) 7) arks)	EFAHÀ	Secondal Surfa Spar Drair Oxidi C3) (wt Satur X Geon	ry Indicators (minimum of two required notes Soil Cracks (B6) sely Vegetated Concave Surface (B8) nage Patterns (B10) zed Rhizospheres on Living Roots (Careretilled) fish Burrows (C8) nation Visible on Aerial Imagery (C9) norphic Position (D2) Neutral Test (D5) Heave Hummocks (D7) (LRR F)
Type:	erial Imagery (B7) Yes No.	check all that apply) Salt Crust (B Aquatic Inver Hydrogen St Dry-Season 1 Oxidized Rhi (where not Presence of I Thin Muck St Other (Explain	ntebrates ulfide Odowater Tai zosphere t tilled) Reduced urface (Cin in Rem	(B13) or (C1) ble (C2) s on Livir Iron (C4) 7) arks)	EFAHÀ	Secondal Surfa Spar Drair Oxidi C3) (wt Satur X Geon	ry Indicators (minimum of two required to Soli Cracks (B6) seld Vegetated Concave Surface (B8) and Patterns (B10) and Roots (Calere tilled) sish Burrows (C8) attorn Visible on Aerial Imagery (C9) morphic Position (D2) Neutral Test (D5)
Depth (inches): emarks: Site OCCUM AST, THE REDO) FOROLOGY Fetland Hydrology Indication (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Au Water-Stained Leaves (eld Observations: Irface Water Present?	erial Imagery (B7) Yes No Yes No Yes No	check all that apply) Salt Crust (B Aquatic Invei Hydrogen Su Dry-Season Oxidized Rhi (where not Presence of I Thin Muck St Other (Explai	in in Rem	(B13) or (C1) ble (C2) s on Livir (C4) 7) arks)	eratio	Seconda Surfa Sur	ry Indicators (minimum of two required notes Soil Cracks (B6) sely Vegetated Concave Surface (B8) nage Patterns (B10) zed Rhizospheres on Living Roots (Careretilled) fish Burrows (C8) nation Visible on Aerial Imagery (C9) norphic Position (D2) Neutral Test (D5) Heave Hummocks (D7) (LRR F)
Type:	erial Imagery (B7) Yes No Yes No Yes No	check all that apply) Salt Crust (B Aquatic Invei Hydrogen Su Dry-Season Oxidized Rhi (where not Presence of I Thin Muck St Other (Explai	in in Rem	(B13) or (C1) ble (C2) s on Livir (C4) 7) arks)	eratio	Seconda Surfa Sur	ry Indicators (minimum of two required notes Soil Cracks (B6) sely Vegetated Concave Surface (B8) nage Patterns (B10) zed Rhizospheres on Living Roots (Careretilled) fish Burrows (C8) nation Visible on Aerial Imagery (C9) norphic Position (D2) Neutral Test (D5) Heave Hummocks (D7) (LRR F)
Type:	erial Imagery (B7) Yes No Yes No ream gauge, monitored.	check all that apply) Salt Crust (B Aquatic Invei Hydrogen Su Dry-Season V Oxidized Rhi (where not Presence of I Thin Muck St Other (Explai	in in Rem	(B13) or (C1) ble (C2) s on Livir Iron (C4) 7) arks)	ng Roots (C	Secondal Surfa Sur	ry Indicators (minimum of two required are Soil Cracks (B6) sely Vegetated Concave Surface (B8) arge Patterns (B10) zed Rhizospheres on Living Roots (C3) are tilled) fish Burrows (C8) ration Visible on Aerial Imagery (C9) norphic Position (D2) Neutral Test (D5) -Heave Hummocks (D7) (LRR F)

Project/Site: 1- 70 FAST	City/County:	A MS Sampling Date: 9/1/20
Applicant/Owner:CDOT		State: Sampling Point:
	WWEV Section, Township, F	Range: 528 735 R66W
	DitcH Local relief (concave	e, convex, none): CONCAVE Slope (%): 4/
		2 Long: -104.78460203 Datum: W658
Soil Map Unit Name: ASCALON - PLATN		
Are climatic / hydrologic conditions on the site typical fo		
		e "Normal Circumstances" present? YesX No
Are Vegetation, Soil, or Hydrology		needed, explain any answers in Remarks.)
		locations, transects, important features, etc
201	No Is the Sample	rounding, managed, important routeros, etc
	No.	
Wetland Hydrology Present? Yes _><	Within a Weti	and? YesX No
Control of the Contro	7,555,555	0 5.00
Remarks: South OF I-70, WES	tot lover love	DEXIT
ROADSIDE DITCH, PEM, R	IVERINE.	
EGETATION – Use scientific names of p	lants.	
	Absolute Dominant Indicator	
Tree Stratum (Plot size:)	% Cover Species? Status	Number of Dominant Species
1 2		That Are OBL, FACW, or FAC (excluding FAC-): (A)
3.		Total Number of Deminant
1.		Species Across All Strata:(B)
	= Total Cover	Percent of Dominant Species
Sapling/Shrub Stratum (Plot size:)	, , , , , , , , , , , , , , , , , , , ,	That Are OBL, FACW, or FAC: (A/B)
l		Prevalence Index worksheet:
2		
3		OBL species x 1 =
i		FACW species x 2 =
AVENICA-SI	= Total Cover	FAC species x 3 =
Herb Stratum (Plot size: 3 FT)		FACU species x 4 =
. Typha LatiFolia	70 YES OBL	UPL species x 5 =
SCHOENIOPLECTUS ACUTUS		Column Totals: (A) (B)
Rumex crispus		Prevalence Index = B/A =
Bromus INFAMIS		Hydrophytic Vegetation Indicators:
Solvanium Sp.		1 - Rapid Test for Hydrophytic Vegetation
/		∠ 2 - Dominance Test is >50%
		3 - Prevalence Index is ≤3.01
		4 - Morphological Adaptations ¹ (Provide supporting
0		data in Remarks or on a separate sheet)
·	77 = Total Cover	Problematic Hydrophytic Vegetation¹ (Explain)
Voody Vine Stratum (Plot size:)		¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
		Hydrophytic
	= Total Cover	Vegetation
Bare Ground in Herb Stratum	, , , , , , , , , , , , , , , , ,	Present? Yes X No
temarks:		
PEMIN ROADSIDE DITCH.		

	pth needed to document the indicator or co	nfirm the absence of i	ndicators.)
Depth Matrix (inches) Color (moist) %	Redox Features Color (moist) % Type¹ Lo	Texture	Remarks
53.			
Type: C=Concentration, D=Depletion, RN	M=Reduced Matrix, CS=Covered or Coated San	d Grains. ² Locatio	n: PL=Pore Lining, M=Matrix.
ydric Soil Indicators: (Applicable to al	I LRRs, unless otherwise noted.)	Indicators for	Problematic Hydric Soils ³ :
_ Histosol (A1)	Sandy Gleyed Matrix (S4)	1 cm Muck	(A9) (LRR I, J)
_ Histic Epipedon (A2)	Sandy Redox (S5)		rie Redox (A16) (LRR F, G, H)
Black Histic (A3)	Stripped Matrix (S6)	The state of the s	ce (S7) (LRR G)
_ Hydrogen Sulfide (A4) _ Stratified Layers (A5) (LRR F)	 Loamy Mucky Mineral (F1) Loamy Gleyed Matrix (F2) 		Depressions (F16)
_ 1 cm Muck (A9) (LRR F, G, H)	Depleted Matrix (F3)	Reduced V	outside of MLRA 72 & 73)
_ Depleted Below Dark Surface (A11)	Redox Dark Surface (F6)		Material (TF2)
_ Thick Dark Surface (A12)	Depleted Dark Surface (F7)		ow Dark Surface (TF12)
_ Sandy Mucky Mineral (S1)	Redox Depressions (F8)	Other (Exp	ain in Remarks)
_ 2.5 cm Mucky Peat or Peat (S2) (LRR	(2012년 1825년 : 18 0 1 2일 17일 : 프라이어 (1913년 1913년) (1913년) (1913년) (1913년) (1913년) (1913년)	3Indicators of hy	drophytic vegetation and
5 cm Mucky Peat or Peat (S3) (LRR F)	(MLRA 72 & 73 of LRR H)		drology must be present,
estrictive Layer (if present):		uniess disti	urbed or problematic.
ostricuve Layer (ii present).		1	
Tyne:			
Type: Depth (inches):		Hydric Soil Pres	sent? Yes × No
Depth (inches):	SumED. CONCRETE LIN	The state of the second second	sent? Yes <u>×</u> No
Depth (inches):	SumED. CONCRETE Lin	The state of the second second	sent? Yes <u></u> No
Depth (inches): emarks: #yDRic Soils AS	SumED. CONCRETE Lin	The state of the second second	sent? Yes <u>×</u> No
Depth (inches): emarks: HyDRic Soils AS		ED DITCH.	
Depth (inches): emarks: #ynnic Soils As DROLOGY etland Hydrology Indicators: imary Indicators (minimum of one require	d; check all that apply)	Secondary In	dicators (minimum of two required
Depth (inches):	d; check all that apply) Salt Crust (B11)	Secondary In Surface S	dicators (minimum of two required
Depth (inches): emarks: #ynnic Soils As DROLOGY etland Hydrology Indicators: imary Indicators (minimum of one require	d; check all that apply)	Secondary In Surface S Sparsely	dicators (minimum of two required Soil Cracks (B6) Vegetated Concave Surface (B8)
DROLOGY etland Hydrology Indicators: imary Indicators (minimum of one required) Surface Water (A1) High Water Table (A2)	d; check all that apply) Salt Crust (B11) Aquatic Invertebrates (B13)	Secondary In Surface S Sparsely Drainage	dicators (minimum of two required
DROLOGY etland Hydrology Indicators: imary Indicators (minimum of one required) Surface Water (A1) High Water Table (A2) Saturation (A3)	d; check all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1)	Secondary In Surface S Sparsely Drainage Oxidized	dicators (minimum of two required Soil Cracks (B6) Vegetated Concave Surface (B8) Patterns (B10) Rhizospheres on Living Roots (C3
DROLOGY etland Hydrology Indicators: imary Indicators (minimum of one required) Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1)	d; check all that apply) — Salt Crust (B11) — Aquatic Invertebrates (B13) — Hydrogen Sulfide Odor (C1) — Dry-Season Water Table (C2)	Secondary In Surface S Sparsely Drainage Oxidized	dicators (minimum of two required Soil Cracks (B6) Vegetated Concave Surface (B8) Patterns (B10) Rhizospheres on Living Roots (C3 tilled)
DROLOGY etland Hydrology Indicators: imary Indicators (minimum of one required) Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2)	d; check all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roc	Secondary In Surface S Sparsely Drainage Oxidized (where Crayfish i	dicators (minimum of two required Soil Cracks (B6) Vegetated Concave Surface (B8) Patterns (B10) Rhizospheres on Living Roots (C3 tilled)
Depth (inches):	d; check all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roc (where not tilled)	Secondary In Surface S Sparsely Drainage Oxidized (where Crayfish I Saturation	dicators (minimum of two required Soil Cracks (B6) Vegetated Concave Surface (B8) Patterns (B10) Rhizospheres on Living Roots (C3 tilled) Burrows (C8)
Depth (inches): Pemarks: Hyllic Soils AS DROLOGY etland Hydrology Indicators: imary Indicators (minimum of one required Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4)	d; check all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roc (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7)	Secondary In Surface S Sparsely Drainage Oxidized (where Crayfish I Saturation Geomorp	dicators (minimum of two required Soil Cracks (B6) Vegetated Concave Surface (B8) Patterns (B10) Rhizospheres on Living Roots (C3 tilled) Burrows (C8) In Visible on Aerial Imagery (C9)
Depth (inches):	d; check all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roc (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7)	Secondary In Surface S Sparsely Drainage Oxidized (where Crayfish I Saturation Geomorp FAC-Neur	dicators (minimum of two required Soil Cracks (B6) Soil Cracks (B6) Vegetated Concave Surface (B8) Patterns (B10) Rhizospheres on Living Roots (C3 tilled) Burrows (C8) In Visible on Aerial Imagery (C9) Inic Position (D2)
Depth (inches): Pemarks: Hyl) Ric Soils AS DROLOGY etland Hydrology Indicators: Imary Indicators (minimum of one required Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9) Ind Observations:	d; check all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roc (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7) Other (Explain in Remarks)	Secondary In Surface S Sparsely Drainage Oxidized (where Crayfish I Saturation Geomorp FAC-Neur	dicators (minimum of two required Soil Cracks (B6) Vegetated Concave Surface (B8) Patterns (B10) Rhizospheres on Living Roots (C3 tilled) Burrows (C8) In Visible on Aerial Imagery (C9) Inic Position (D2)
DROLOGY etland Hydrology Indicators: mary Indicators (minimum of one required) Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B3) Water-Stained Leaves (B9) Id Observations: face Water Present? Yes	d; check all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roc (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7) Other (Explain in Remarks)	Secondary In Surface S Sparsely Drainage Oxidized (where Crayfish I Saturation Geomorp FAC-Neur	dicators (minimum of two required Soil Cracks (B6) Vegetated Concave Surface (B8) Patterns (B10) Rhizospheres on Living Roots (C3 tilled) Burrows (C8) In Visible on Aerial Imagery (C9) Inic Position (D2)
Depth (inches):	d; check all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roc (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7) Other (Explain in Remarks)	Secondary In Surface S Sparsely Drainage Oxidized (where Crayfish I Saturation Geomorp FAC-Neu Frost-Hea	dicators (minimum of two required) Soil Cracks (B6) Vegetated Concave Surface (B8) Patterns (B10) Rhizospheres on Living Roots (C3 tilled) Surrows (C8) In Visible on Aerial Imagery (C9) Inic Position (D2) Iral Test (D5) Ive Hummocks (D7) (LRR F)
DROLOGY etland Hydrology Indicators: imary Indicators (minimum of one required) Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B3) Water-Stained Leaves (B9) Id Observations: flace Water Present? Ves	d; check all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roc (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7) Other (Explain in Remarks)	Secondary In Surface S Sparsely Drainage Oxidized (where Crayfish I Saturation Geomorp FAC-Neu Frost-Hea	dicators (minimum of two required Soil Cracks (B6) Vegetated Concave Surface (B8) Patterns (B10) Rhizospheres on Living Roots (C3 tilled) Burrows (C8) In Visible on Aerial Imagery (C9) hic Position (D2) tral Test (D5)
Depth (inches):	d; check all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roc (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7) Other (Explain in Remarks)	Secondary In Surface S Sparsely Drainage Coxidized (where Crayfish I Saturation Geomorp FAC-Neu Frost-Hea	dicators (minimum of two required Soil Cracks (B6) Vegetated Concave Surface (B8) Patterns (B10) Rhizospheres on Living Roots (C3 tilled) Surrows (C8) In Visible on Aerial Imagery (C9) Incl Position (D2) Iral Test (D5) Ive Hummocks (D7) (LRR F)
Depth (inches):	d; check all that apply) — Salt Crust (B11) — Aquatic Invertebrates (B13) — Hydrogen Sulfide Odor (C1) — Dry-Season Water Table (C2) — Oxidized Rhizospheres on Living Roc (where not tilled) — Presence of Reduced Iron (C4) — Thin Muck Surface (C7) — Other (Explain in Remarks) No — Depth (inches):	Secondary In Surface S Sparsely Drainage Oxidized Saturation Geomorp FAC-Neu Frost-Hea	dicators (minimum of two required Soil Cracks (B6) Vegetated Concave Surface (B8) Patterns (B10) Rhizospheres on Living Roots (C3 tilled) Burrows (C8) In Visible on Aerial Imagery (C9) Inic Position (D2) Irral Test (D5) Ive Hummocks (D7) (LRR F)

Project/Site: I- 70 EAST	City/0	County: A	DAMS	Sampling Date: 9/1/201	
Applicant/Owner CDOT			State: (1)	Sampling Point: 285-0	
Investigator(s): ATKINS (MCELDOWNE	(/) Secti	on, Township, F	Range: 5 28	735 R66W	
Landform (hillslope, terrace, etc.): ROADSIDE D	itcH Loca	relief (concave	convex none): Con	VCAVE Slope (%): 4/5	
Subregion (LRR): LRR G	Lat. 39.7	6201436	Long: -104. 78	103526 Datum: 14658	
Soil Map Unit Name: ASCA-CONI - PLATINET	2 Associa	High	NIMI class	effication: A/OA/F	
Are climatic / hydrologic conditions on the site typical for					
Are Vegetation					
Are Vegetation	_ significantly distur	obur Ale	s Normal Circumstances	present res No	
SUMMARY OF FINDINGS – Attach site ma	p snowing sam	ipling point	locations, transec	ts, important features, etc.	
Hydrophytic Vegetation Present? YesX_		Is the Sample	ed Area		
Hydric Soil Present? Yes No within a Wetlar			nd? Yes No		
Wetland Hydrology Present? Yes					
Remarks: SoutHSIDE OF I-70, W	est of To	WER RO	MAD EXIT.		
PSS, RIVERINE			(10,100)	43	
VEGETATION - Use scientific names of pla	nts.				
T0-1	Absolute Dom			rksheet:	
Tree Stratum (Plot size:)	% Cover Spec	ies? Status	Number of Dominant		
1			That Are OBL, FACW (excluding FAC-):	V, 8F FAC 2 (A)	
3			Total Number of Dom	pinnet	
4.			Species Across All St		
- />-	= Tota	al Cover	Percent of Dominant	Spanies 7.64	
Sapling/Shrub Stratum (Plot size: 30 'Di'A.)		T	That Are OBL FACW	Species V, or FAC: <u>67%</u> (A/B)	
1. SALIX AMYGDALOIDES	-62 Y	FS HACK	Prevalence Index wo	orkeheet	
2. SALIX EXIGUA	15 1	10 FACL	VI	: Multiply by:	
3				x1=	
5			FACW species	x 2 =	
J	77 = Tota	l Cover	FAC species	x3=	
Herb Stratum (Plot size: 3 / DiA,	2.0	a.		x 4 =	
1. Typha LATIFOLIA		ES OBL		x 5 =	
2. Rumex Chispus		10 FAC	Column Totals:	(A) (B)	
3. Solanium Sp.		10 FAC	Prevalence Inde	ex = B/A =	
4. Bromus INERMIS		O UPL	Hydrophytic Vegetat		
5. FESTUCA PRATERISIS 6. CIRSIUM ARVERISE		O FACU	시 아이들이 있다는 경험은 독일을 하지만 모두 하였다.	Hydrophytic Vegetation	
6. CINSIUM HICUERISE		THU	≥ 2 - Dominance Te	est is >50%	
8			3 - Prevalence Inc	dex is ≤3.01	
9			4 - Morphological	Adaptations ¹ (Provide supporting	
10				ks or on a separate sheet)	
AND PARTY AND THE PARTY AND TH	25 = Total	Cover	Control of the second	ophytic Vegetation ¹ (Explain)	
Woody Vine Stratum (Plot size:)			¹ Indicators of hydric so be present, unless dist	oil and wetland hydrology must	
1			be present, unless dist	turbed of problematic.	
2			Hydrophytic Vegetation		
% Bare Ground in Herb Stratum 75	= Total	Cover		es_X No	
Remarks: Dec					
755					
S Army Come of Engineers				Great Plains - Version 2.0	

Depth Matrix	Redox Features	- About the second seco
(inches) Color (moist)	% Color (moist) % Type Loc ²	Texture Remarks
		_
		
And the second s	n, RM=Reduced Matrix, CS=Covered or Coated Sand	
	to all LRRs, unless otherwise noted.)	Indicators for Problematic Hydric Soils ³ :
Histosol (A1) Histic Epipedon (A2)	Sandy Gleyed Matrix (S4) Sandy Redox (S5)	1 cm Muck (A9) (LRR I, J)
Black Histic (A3)	Saridy Redox (S5) Stripped Matrix (S6)	Coast Prairie Redox (A16) (LRR F, G, H) Dark Surface (S7) (LRR G)
Hydrogen Sulfide (A4)	Loamy Mucky Mineral (F1)	High Plains Depressions (F16)
Stratified Layers (A5) (LRR F)	Loamy Gleyed Matrix (F2)	(LRR H outside of MLRA 72 & 73)
1 cm Muck (A9) (LRR F, G, H)	Depleted Matrix (F3)	Reduced Vertic (F18)
Depleted Below Dark Surface (A1		Red Parent Material (TF2)
_ Thick Dark Surface (A12)	Depleted Dark Surface (F7)	Very Shallow Dark Surface (TF12)
Sandy Mucky Mineral (S1)	Redox Depressions (F8)	Other (Explain in Remarks)
2.5 cm Mucky Peat or Peat (S2) (L	LRR G, H) High Plains Depressions (F16)	3Indicators of hydrophytic vegetation and
_ 5 cm Mucky Peat or Peat (S3) (LR	(MLRA 72 & 73 of LRR H)	wetland hydrology must be present, unless disturbed or problematic.
estrictive Layer (if present):		
Type:		THE RESERVE THE TOTAL THE
Depth (inches):		Hydric Soil Present? Yes No
Depth (inches): emarks: HyDRic Soils	ASSUMED. SOME STAN	
Depth (inches):		
Depth (inches): emarks: typric Soils Dital 15 conta		
Depth (inches):	erete Lined,	DING WATER IN DITCH.
Depth (inches):	CRETE LINED,	Secondary Indicators (minimum of two requires
Depth (inches):	quired; check all that apply) Salt Crust (B11)	Secondary Indicators (minimum of two requires Surface Soil Cracks (86)
Depth (inches):	quired; check all that apply) Salt Crust (B11) Aquatic Invertebrates (B13)	Secondary Indicators (minimum of two requires Surface Soil Cracks (86) Sparsely Vegetated Concave Surface (88)
Depth (inches):	quired; check all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1)	Secondary Indicators (minimum of two requires Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10)
Depth (inches):	quired; check all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2)	Secondary Indicators (minimum of two requires Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C
Depth (inches):	quired; check all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roots	Secondary Indicators (minimum of two requires Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C) (C3) (where tilled)
Depth (inches):	quired; check all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roots (where not tilled)	Secondary Indicators (minimum of two require Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C0) (Where tilled) Crayfish Burrows (C8)
Depth (inches): emarks: HyDRic Soils Dittle Soils Conto DROLOGY etland Hydrology Indicators: imary Indicators (minimum of one red Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4)	quired; check all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roots (where not tilled) Presence of Reduced Iron (C4)	Secondary Indicators (minimum of two required Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C (where tilled) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9)
Depth (inches): emarks: Hypric Soils Dittle 15 Conto DROLOGY etland Hydrology Indicators: imary Indicators (minimum of one red Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5)	Quired; check all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roots (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7)	Secondary Indicators (minimum of two required Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C) (C3) (where tilled) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2)
Depth (inches): Demarks: Hypric Soils Dirths Soils DROLOGY etland Hydrology Indicators: imary Indicators (minimum of one reg Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagen	Quired; check all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roots (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7)	Secondary Indicators (minimum of two requires Surface Soll Cracks (B6) Sparsely Vegetated Concave Surface (B8) Trainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C (C3) (where tilled) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2) FAC-Neutral Test (D5)
Depth (inches):	Quired; check all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roots (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7)	Secondary Indicators (minimum of two required Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C (Where tilled) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2)
Depth (inches): emarks: Hypric Soils Ditth Is Conto DROLOGY etland Hydrology Indicators: imary Indicators (minimum of one red Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imager, Water-Stained Leaves (B9)	auired; check all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roots (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7) y (B7) Other (Explain in Remarks)	Secondary Indicators (minimum of two requires Surface Soll Cracks (B6) Sparsely Vegetated Concave Surface (B8) Trainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C (C3) (where tilled) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2) FAC-Neutral Test (D5)
Depth (inches): emarks: Hypric Soils Dittit 15 Conto DROLOGY etland Hydrology Indicators: imary Indicators (minimum of one reg Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagen Water-Stained Leaves (B9) eld Observations: rface Water Present? Yes	muired; check all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roots (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7) y (B7) Other (Explain in Remarks)	Secondary Indicators (minimum of two requires Surface Soll Cracks (B6) Sparsely Vegetated Concave Surface (B8) Trainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C (C3) (where tilled) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2) FAC-Neutral Test (D5)
Depth (inches):	Duired; check all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roots (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7) y (B7) Other (Explain in Remarks)	Secondary Indicators (minimum of two requires Surface Soll Cracks (B6) Sparsely Vegetated Concave Surface (B8) Trainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C) (C3) (where tilled) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2) FAC-Neutral Test (D5) Frost-Heave Hummocks (D7) (LRR F)
Depth (inches): emarks: HyDRic Soil(s) Dittle Soil(s) Dittle Soil(s) Dittle Soil(s) Dittle Soil(s) Dittle Soil(s) Dittle Soil(s) Etland Hydrology Indicators: imary Indicators (minimum of one red Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery Water-Stained Leaves (B9) Indicators	quired; check all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roots (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7) Y (B7) Other (Explain in Remarks)	Secondary Indicators (minimum of two required Surface Soll Cracks (B6) Sparsely Vegetated Concave Surface (B8) Toalinage Patterns (B10) Oxidized Rhizospheres on Living Roots (C (where tilled) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2) FAC-Neutral Test (D5) Frost-Heave Hummocks (D7) (LRR F)
Depth (inches): emarks: HyDRic Soil(s) Dittle Soil(s) Dittle Soil(s) Dittle Soil(s) Dittle Soil(s) Dittle Soil(s) Dittle Soil(s) Etland Hydrology Indicators: imary Indicators (minimum of one red Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery Water-Stained Leaves (B9) Indicators	Duired; check all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roots (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7) y (B7) Other (Explain in Remarks)	Secondary Indicators (minimum of two required Surface Soil Cracks (B6) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Toalinage Patterns (B10) Oxidized Rhizospheres on Living Roots (C (Where tilled) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2) FAC-Neutral Test (D5) Frost-Heave Hummocks (D7) (LRR F)

			AMS Sampling Date: 9/1/201
Applicant/Owner: CDOT	161		State: CO Sampling Point: 285-0
Investigator(s): ATKING (M	1 (ELDOWNEY)	Section, Township, F	Range:
Landform (hillslope, terrace, etc.):	ZUADSIDE BITCH	Local relief (concave	e, convex, none): CONCAVE Slope (%): 4/
Subregion (LRR): LRR G	Lat: _ ²	39.76049461	Long: -104,77665766 Datum: WGS
Soil Map Unit Name: PLATALER	Llonm, O to 3	% SLOPES	NWI classification: NONF
Are climatic / hydrologic conditions on the			
Are Vegetation			e "Normal Circumstances" present? Yes X No
Are Vegetation, Soil, or I			needed, explain any answers in Remarks.)
			locations, transects, important features, etc.
Hydrophytic Vegetation Present?	Yes _ X No	In the Commis	-1 *
Hydric Soil Present?	Yes _ k _ No	is the Sample	and? YesX_ No
Wetland Hydrology Present?	Yes > No	within a weti	andr Tes NO
Remarks: Sound of EB of	, 		were re-
	Absolute		
Tree Stratum (Plot size:		Species? Status	Number of Dominant Species
1 2			That Are OBL, FACW, or FAC (excluding FAC-):
3			Total Number of Dominant
4.			Species Across All Strata: (B)
	_	= Total Cover	Percent of Dominant Species
Sapling/Shrub Stratum (Plot size:			That Are OBL, FACW, or FAC:(A/B)
1 2		· — · — ·	Prevalence Index worksheet:
3,			Total % Cover of: Multiply by:
			OBL species x 1 =
5,			FACW species x 2 =
/		= Total Cover	FAC species x 3 =
Herb Stratum (Plot size: / //		VES Eas	FACU species x 4 =
SCHOENORIECTUS ACH		YES HAC	UPL species x 5 =
PERSICARIA SO. (SI	MARTHEN 2	NO OBL	Column Totals: (A) (B)
CIRSIUM ARVENSE		NO FACU	Prevalence Index = B/A =
Bromus INERMIS		NO UPL	Hydrophytic Vegetation Indicators:
PUMEX CRISAUS			∠ 1 - Rapid Test for Hydrophytic Vegetation
CHENOPODIUM Sp.			≥ 2 - Dominance Test is >50%
			3 - Prevalence Index is ≤3.01
756			4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
0			Problematic Hydrophytic Vegetation¹ (Explain)
loody Vine Stratum (Plot size:		= Total Cover	Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Book Council in Uset Clastics		= Total Cover	Hydrophytic Vegetation Present? Yes No
Bare Ground in Herb Stratum			163 27 10
Remarks: PEM IN ROADSID	E DitcH.		

Sampling Point: 285-03 SOIL Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Color (moist) Color (moist) ¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix. Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils3: __ Sandy Gleyed Matrix (S4) __ 1 cm Muck (A9) (LRR I, J) __ Coast Prairie Redox (A16) (LRR F, G, H) Histic Epipedon (A2) Sandy Redox (S5) __ Black Histic (A3) __ Stripped Matrix (S6) __ Dark Surface (S7) (LRR G) __ Hydrogen Sulfide (A4) __ Loamy Mucky Mineral (F1) __ High Plains Depressions (F16) Stratified Layers (A5) (LRR F) __ Loamy Gleyed Matrix (F2) (LRR H outside of MLRA 72 & 73) _ 1 cm Muck (A9) (LRR F, G, H) __ Depleted Matrix (F3) Reduced Vertic (F18) __ Redox Dark Surface (F6) Depleted Below Dark Surface (A11) __ Red Parent Material (TF2) Depleted Dark Surface (F7) __ Very Shallow Dark Surface (TF12) Thick Dark Surface (A12) ___ Sandy Mucky Mineral (S1) Redox Depressions (F8) Other (Explain in Remarks) 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) ___ High Plains Depressions (F16) ³Indicators of hydrophytic vegetation and 5 cm Mucky Peat or Peat (S3) (LRR F) (MLRA 72 & 73 of LRR H) wetland hydrology must be present. unless disturbed or problematic. Restrictive Layer (if present): Type: _ Depth (inches): ___ Hydric Soil Present? Yes _ * No_ Remarks: HyDRIC Soils ASSUMED. STANDING WATTER. CONCRETE LINEA DITEH. HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) __ Salt Crust (B11) X Surface Water (A1) __ Surface Soil Cracks (B6) ___ Aquatic Invertebrates (B13) __ Sparsely Vegetated Concave Surface (B8) High Water Table (A2) X Saturation (A3) __ Hydrogen Sulfide Odor (C1) __ Drainage Patterns (B10) __ Water Marks (B1) ___ Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roots (C3) ___ Sediment Deposits (B2) Oxidized Rhizospheres on Living Roots (C3) (where tilled) Drift Deposits (B3) (where not tilled) Crayfish Burrows (C8) ___ Algal Mat or Crust (B4) __ Presence of Reduced Iron (C4) __ Saturation Visible on Aerial Imagery (C9) __ Iron Deposits (B5) Thin Muck Surface (C7) Geomorphic Position (D2) __ Inundation Visible on Aerial Imagery (B7) __ Other (Explain in Remarks) FAC-Neutral Test (D5) Water-Stained Leaves (B9) Frost-Heave Hummocks (D7) (LRR F) Field Observations: Yes _____ No ____ Depth (inches): ____ Z
Yes ____ No ____ Depth (inches): _____ Surface Water Present? Water Table Present? Saturation Present? Yes _x No ___ Depth (inches): _O Wetland Hydrology Present? Yes X No (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: CONCRETE LINED ROADSIDE DITCH.

	City/County: _	DENVER Sampling Date: 9/1/701
Applicant/Owner: CDOT		State: (O) Sampling Point: 285-05
Investigator(s): Attains (MELI	Section, Town	ship, Range: 528, 735, R66W
Landform (hillslope, terrace, etc.): ROADS IDF	Diret Local relief (co	oncave, convex, none): CONCAVE Slope (%): 4/5
Subregion (LRR): LRR G	Lat:	Long: Datum:
Soil Map Unit Name: PLATNER COAM	0 to 3 % Slopes	NWI classification: NONE
Are climatic / hydrologic conditions on the site typical	for this time of year? Yes 🗡	_ No (If no, explain in Remarks.)
Are Vegetation _ M_, Soil _ M_, or Hydrology		Are "Normal Circumstances" present? Yes No
Are Vegetation, Soil, or Hydrology	/ naturally problematic?	(If needed, explain any answers in Remarks.)
		point locations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes X	No le the S	ampled Area
	No within a	Wetland? Yes _ X _ No
Wetland Hydrology Present? Yes	_ NO	The state of the s
A ROADSIDE DITCH.	IFFRAMP AT TOU	ER RUMO, PEM. RIVERINE IN
/EGETATION – Use scientific names of	plants. Absolute Dominant Ind	icator Dominance Test worksheet
Tree Stratum (Plot size:)	% Cover Species? St	
		That Are OBL, FACW, or FAC
2		(excluding FAC-):
3		Total Number of Dominant
4		Species Across All Strata: (B)
Sapling/Shrub Stratum (Plot size:1.	= Total Cover	Percent of Dominant Species That Are OBL, FACW, or FAC: (A/B)
2.		Prevalence Index worksheet:
3.		Total % Cover of: Multiply by:
1.		OBL species x 1 =
5		FACW species x·2 =
1	= Total Cover	FAC species x 3 =
Herb Stratum (Plot size: /m)	IT VICE	FACU species x 4 =
EUMEX CRISBUS	15 YES 0	
SCHORNOPLECTUS ACUTU		Column Totals: (A) (B)
FESTUCIA ARATEMS IS	15 YES FA	
HEREN THE PROPERTY OF	— // /// II	Hydrophytic Vegetation Indicators:
		1 - Rapid Test for Hydrophytic Vegetation
		∠ 2 - Dominance Test is >50%
		3 - Prevalence Index is ≤3.01
-		4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
0		Problematic Hydrophytic Vegetation¹ (Explain)
Voody Vine Stratum (Plot size:)	= Total Cover	Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
:		Hydrophytic Vegetation
6 Bare Ground in Herb Stratum 45	= Total Cover	Present? Yes No
Remarks: MOWED.		

	needed to document the indicator or conf	
Depth Matrix (inches) Color (moist) %	Redox Features Color (moist) % Type¹ Loc²	Texture Remarks
Type: C=Concentration, D=Depletion, RM=Re lydric Soil Indicators: (Applicable to all LR	Rs, unless otherwise noted.)	Indicators for Problematic Hydric Soils ³ :
Histosol (A1) Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4) Stratified Layers (A5) (LRR F) 1 cm Muck (A9) (LRR F, G, H)	Sandy Gleyed Matrix (S4) Sandy Redox (S5) Stripped Matrix (S6) Loamy Mucky Mineral (F1) Loamy Gleyed Matrix (F2) Depleted Matrix (F3)	1 cm Muck (A9) (LRR I, J) Coast Prairie Redox (A16) (LRR F, G, H) Dark Surface (S7) (LRR G) High Plains Depressions (F16) (LRR H outside of MLRA 72 & 73) Reduced Vertic (F18)
Depleted Below Dark Surface (A11) Thick Dark Surface (A12) Sandy Mucky Mineral (S1) 2.5 cm Mucky Peat or Peat (S2) (LRR G, H 5 cm Mucky Peat or Peat (S3) (LRR F)	Redox Dark Surface (F6) Depleted Dark Surface (F7) Redox Depressions (F8)	Red Parent Material (TF2) Very Shallow Dark Surface (TF12) Other (Explain in Remarks) 3Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
Restrictive Layer (if present):		
Type: Depth (inches):		Hydric Soil Present? Yes X No
Depth (inches):	+ - Hypric Soils Ass	
Depth (Inches):	H - Hypric Soils Ass	
Depth (inches):Remarks:	H - Hypric soils Ass	
Depth (inches):		
Depth (inches): Remarks: CONCINETE LINED DITCT YDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required; ch	eck all that apply) Salt Crust (B11)	Secondary Indicators (minimum of two required) Surface Soil Cracks (B6)
Depth (inches):	eck all that apply) Salt Crust (B11) Aquatic Invertebrates (B13)	Secondary Indicators (minimum of two required) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8)
Depth (inches):	eck all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1)	Secondary Indicators (minimum of two required) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10)
Depth (inches):	meck all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2)	Secondary Indicators (minimum of two required) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3)
Depth (inches):	leck all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roots	Secondary Indicators (minimum of two required Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) (where tilled)
Depth (inches):	leck all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roots (where not tilled)	Secondary Indicators (minimum of two required Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) (where tilled) Crayfish Burrows (C8)
Depth (inches): Remarks: CONCRETE (INED DITCH YDROLOGY Vetland Hydrology Indicators: trimary Indicators (minimum of one required; ch Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4)	leck all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roots	Secondary Indicators (minimum of two required Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) (where tilled)
Depth (inches):	seck all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roots (where not tilled) Presence of Reduced Iron (C4)	Secondary Indicators (minimum of two required Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) (where tilled) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9)
Depth (inches): Remarks: CONCINETE (INED) Ditch YDROLOGY Vetland Hydrology Indicators: trimary Indicators (minimum of one required; ch Express Water (A1) High Water Table (A2) Express Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5)	seck all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roots (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7)	Secondary Indicators (minimum of two required Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) (where tilled) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2)
Depth (inches): Remarks: CONCINETE LINED DITCT YDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required; ch Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9) ield Observations:	Leck all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roots (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7) Other (Explain in Remarks)	Secondary Indicators (minimum of two required Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) (where tilled) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2) FAC-Neutral Test (D5)
Depth (inches): Remarks: CONCINETE LINED DITCT YDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required; ch Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9) ield Observations:	seck all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roots (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7)	Secondary Indicators (minimum of two required Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) (where tilled) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2) FAC-Neutral Test (D5)
Depth (inches): Remarks: CONCINETE LINED DITCT YDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required; ch Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9) ield Observations: urface Water Present? Yes No	Leck all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roots (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7) Other (Explain in Remarks)	Secondary Indicators (minimum of two required Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) (where tilled) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2) FAC-Neutral Test (D5)
Depth (inches): Remarks: CONCINETE LINED DITCT YDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required; ch Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9) ield Observations: urface Water Present? Ves No	seck all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roots (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7) Other (Explain in Remarks) Depth (inches): Depth (inches):	Secondary Indicators (minimum of two required) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) (where tilled) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2) FAC-Neutral Test (D5)
Depth (inches): Remarks: CONCINETE LINED DITCT YDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required; ch X Surface Water (A1) High Water Table (A2) X Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9) ield Observations: urface Water Present? Yes No vater Table Present? Yes No aturation Present? Yes No	leck all that apply) Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roots (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7) Other (Explain in Remarks)	Secondary Indicators (minimum of two required Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8) Concave Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) (where tilled) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2) FAC-Neutral Test (D5) Frost-Heave Hummocks (D7) (LRR F)

Project/Site: T - 70 EAST	City	//County: At	AMS Sampling Date: 9/1/
Applicant/Owner: CDOT			State: (O Sampling Point: 785
Investigator(s): ATKING (MCELDOU	INEY) Ser	ction, Township, F	Range: 528 T35 R66W
Landform (hillslope, terrace, etc.): Ro∧D(i) €	DitcH Lor	cal relief (concave	e, convex, none): CONCANF Slope (%):_
Subregion (LRR): LRA G	Lat: <u>39.7</u>	25913436	Long: -104.77430936 Datum: WG
Soil Map Unit Name: PLB - PLATNER LOA	m 0 to 3%	Slones	NWI classification: NONE
Are climatic / hydrologic conditions on the site typical	for this time of year?	Yes X No	(If no, explain in Remarks.)
			e "Normal Circumstances" present? Yes No_
Are Vegetation, Soil, or Hydrology	naturally probler		needed, explain any answers in Remarks.)
			locations, transects, important features,
	No	Is the Sample	ed Area
	No	within a Wetla	
Wetland Hydrology Present? Yes _>			
Remarks: EAST BOUNID OFF RAD			
PSS, RIVERINE WETCH	10 IN ROX	HOSIDE D	itett.
/EGETATION – Use scientific names of			
To a Ottobar (District		minant Indicator	
Tree Stratum (Plot size:) 1	% Cover Sp	ecies? Status	Number of Dominant Species
2.			That Are OBL, FACW, or FAC (excluding FAC-):
3			Total Number of Dominant / /
4			Species Across All Strata:
	= To	otal Cover	Percent of Dominant Species
Sapling/Shrub Stratum (Plot size: 30 DiA 1. SALIX EXIGUA	O(L)	Ver Incu	That Are ORL FACW or FAC
1. JACIX EXIGUA 2.		YES THEW	Prevalence Index worksheet:
3			Total % Cover of: Multiply by:
4			OBL species x 1 =
5.			FACW species x 2 =
	94 = To	tal Cover	FAC species x 3 =
Herb Stratum (Plot size: / n/)	5	ES ORL	FACU species x 4 =
SCHOENOPLECTUS ACUTUS		les OBL	UPL species x 5 = Column Totals: (A) (
B. ScHUENOP (FCTUS MARITIMUS			Column Totals (A) (
CIRSIUM ARVENSE			Prevalence Index = B/A =
			Hydrophytic Vegetation Indicators:
S			1 - Rapid Test for Hydrophytic Vegetation
			X 2 - Dominance Test is >50%
			3 - Prevalence Index is ≤3.0¹ 4 - Morphological Adaptations¹ (Provide support
·			data in Remarks or on a separate sheet)
0			Problematic Hydrophytic Vegetation¹ (Explain)
Voody Vine Stratum (Plot size:)	= Tota	al Cover	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
		-10	Hydrophytic Vegetation
6 Bare Ground in Herb Stratum	= Tota	ai Cover	Present? Yes No
Remarks: PSS, RIVELINE WELL		1	
133, KIVEMNE WEST	AND		
	7		
Army Corns of Engineers			

Sampling Point: 285-05 SOIL Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Redox Features % Type¹ Loc² Texture Color (moist) Color (moist) ¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix. Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils3: Sandy Gleyed Matrix (S4) __ 1 cm Muck (A9) (LRR I, J) __ Coast Prairie Redox (A16) (LRR F, G, H) Histic Epipedon (A2) Sandy Redox (S5) __ Dark Surface (S7) (LRR G) Black Histic (A3) Stripped Matrix (S6) Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) __ High Plains Depressions (F16) Stratified Layers (A5) (LRR F) Loamy Gleyed Matrix (F2) (LRR H outside of MLRA 72 & 73) 1 cm Muck (A9) (LRR F, G, H) Depleted Matrix (F3) Reduced Vertic (F18) Depleted Below Dark Surface (A11) Redox Dark Surface (F6) Red Parent Material (TF2) Thick Dark Surface (A12) Depleted Dark Surface (F7) Very Shallow Dark Surface (TF12) Sandy Mucky Mineral (S1) Redox Depressions (F8) Other (Explain in Remarks) ³Indicators of hydrophytic vegetation and 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) High Plains Depressions (F16) 5 cm Mucky Peat or Peat (S3) (LRR F) (MLRA 72 & 73 of LRR H) wetland hydrology must be present, unless disturbed or problematic. Restrictive Layer (if present): Type: ____ Depth (inches): ____ Hydric Soil Present? Yes Remarks: STANDING WATER - HYDRIC SOILS ASSUMED DITCH IS CONCRETE GNED. **HYDROLOGY** Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) __ Salt Crust (B11) Surface Water (A1) Surface Soil Cracks (B6) __ Aquatic Invertebrates (B13) High Water Table (A2) Sparsely Vegetated Concave Surface (B8) Saturation (A3) __ Hydrogen Sulfide Odor (C1) Drainage Patterns (B10) __ Water Marks (B1) ___ Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roots (C3) ___ Sediment Deposits (B2) Oxidized Rhizospheres on Living Roots (C3) (where tilled) Drift Deposits (B3) (where not tilled) Crayfish Burrows (C8) ___ Algal Mat or Crust (B4) Presence of Reduced Iron (C4) Saturation Visible on Aerial Imagery (C9) _ Thin Muck Surface (C7) Iron Deposits (B5) Geomorphic Position (D2) __ Inundation Visible on Aerial Imagery (B7) __ Other (Explain in Remarks) FAC-Neutral Test (D5) Water-Stained Leaves (B9) Frost-Heave Hummocks (D7) (LRR F) Field Observations: Yes No Depth (inches): O
Yes No Depth (inches): Surface Water Present? Water Table Present? Saturation Present? Yes __X No ____ Depth (inches): ___ Wetland Hydrology Present? Yes __ No _ (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: ROADSIDE DITEH WITH STANDING WATER.

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: I - 70 FAST	City/County:AD/	AMS Sampling Date: <u>01/1/201</u>
Applicant/Oumor: CNAT		State (0 0-11- Date 785-06
Investigator(s): ATKINS (MCFLDOWNE	Section, Township, R	tange: S 28, T35, R 66W
Landform (hillslope, terrace, etc.): ROADSIDE D	Local relief (concave	e, convex, none): CONCANE Slope (%): 4/
Subregion (LRR): LRRG	Lat: 39,7609597	/ Long: -104, 775703/ Datum: WGS 8
Soil Map Unit Name: PLATAIFR LOAM, C	to 3 % Slopes	NWI classification: NONE
Are climatic / hydrologic conditions on the site typical for	this time of year? Yes X No.	(If no explain in Remarks)
Are Vegetation N. Soil N. or Hydrology	significantly disturbed? Are	"Normal Circumstances" present? Yes No
Are Vegetation, Soil, or Hydrology	naturally problematic? (If r	needed explain any answers in Pernarks \
		locations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes	No	
Hydric Soil Present? Yes 🔀	is the sample	and? Yes X No
Wetland Hydrology Present? Yes	No	
PEM, DEPRESSIONAL, ROAD	SidE DiteH	WB ONRAMP Joins HiGHWAY.
VEGETATION – Use scientific names of pia	Absolute Dominant Indicator	I Daminana Tashuadahad
Tree Stratum (Plot size:) 1 2	% Cover Species? Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): (A)
3		Total Number of Dominant Species Across All Strata: Z (B)
Sapling/Shrub Stratum (Plot size:)	= Total Cover	Percent of Dominant Species That Are OBL, FACW, or FAC: (A/B)
1		Prevalence Index worksheet:
3		Total % Cover of:Multiply by:
4		OBL species x 1 =
5		FACW species x 2 =
3 C-	= Total Cover	FAC species x 3 =
Herb Stratum (Plot size: 3 FT)	_38 YES FACW	FACU species x 4 =
1. HORDEUM JUBATUM 2. ECHINOCHLON CRUS-GALLI	55 YES FACE	UPL species x 5 = / Column Totals: (A) (B)
3. Rumex Chispus	5 NO FAC	(A)(B)
4. KOCHIA SCONANIA	2 NO NL	Prevalence Index = B/A =
5/		Hydrophytic Vegetation Indicators:
6		1 - Rapid Test for Hydrophytic Vegetation
7		∑ 2 - Dominance Test is >50%
8		3 - Prevalence Index is ≤3.0¹
9		4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
10		Problematic Hydrophytic Vegetation¹ (Explain)
Woody Vine Stratum (Plot size:) 1	= Total Cover	¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2		Hydrophytic
% Bare Ground in Herb Stratum	= Total Cover	Vegetation Present? Yes No
Remarks:		
PEM.		
S Army Corps of Engineers		Great Plains – Version 2.0

	to the deptr	needed to	o documer	nt the in	ndicator	or confirm	n the absence	of indicators.)
Depth Matrix	%	Calar /m	Redox F			12	T	
(inches) Color (moist) $()-12 10 \text{ VR } \frac{3}{2}$		Color (m		%	Type ¹	_Loc²	Texture	Remarks
0-12 104R3/2	70 0	FILEY 2	6/5PB	70			SANDY	Coan
				_		<u></u>		
Type: C=Concentration, D=Depletydric Soil Indicators: (Applica						d Sand Gr		ation: PL=Pore Lining, M=Matrix. for Problematic Hydric Soils ³ :
_ Histosol (A1)		_ :	Sandy Gley	ed Mat	rix (S4)			uck (A9) (LRR I, J)
Histic Epipedon (A2)		100	Sandy Red					Prairie Redox (A16) (LRR F, G, H)
_ Black Histic (A3)			Stripped Ma		TV.			urface (S7) (LRR G)
_ Hydrogen Sulfide (A4)			oamy Muc				7.7.5	ains Depressions (F16)
Stratified Layers (A5) (LRR F) 1 cm Muck (A9) (LRR F, G, H			oamy Gley Depleted M		200 140 14			R H outside of MLRA 72 & 73) d Vertic (F18)
Depleted Below Dark Surface	San		Redox Dark	100				rent Material (TF2)
_ Thick Dark Surface (A12)	V/		Depleted Da					allow Dark Surface (TF12)
Sandy Mucky Mineral (S1)		_ F	Redox Depr	ressions	s (F8)			Explain in Remarks)
 2.5 cm Mucky Peat or Peat (S 5 cm Mucky Peat or Peat (S3) 		н) — н	ligh Plains (MLRA		sions (F1 of LRR		wetland	If hydrophytic vegetation and hydrology must be present, disturbed or problematic.
estrictive Layer (if present):	-0				-		uriless c	naturbed of problematic.
estrictive Layer (if present):							uness	indubed of problematic.
Type: Depth (inches):		_					Hydric Soil F	resent? Yes × No
Type: Depth (inches):	0. CONT	Ains (6/6).	GlEVE	1) M	OTTLES	AND	Hydric Soil F	resent? Yes × No
Type: Depth (Inches): emarks: Soil 15 mixE TAINED FIME SAND DROLOGY	0. CONT (10 YR		GIEVE	1) M	OTTLES	AND y mais	Hydric Soil F	Present? Yes 🔀 No
Type: Depth (Inches): emarks: Soil IS MixE AINED FIME SAND DROLOGY etland Hydrology Indicators:		24070	1	1) M	OFFLES	AND MOIS	Hydric Soil F LENSES St THROW	oresent? Yes × No of artianic fultant profile.
Type: Depth (inches): emarks: Soil IS MixE AINED FIME SAND DROLOGY estand Hydrology Indicators: mary Indicators (minimum of one		heck all tha	at apply)		ottles VE14	AND MOIS	Hydric Soil F LENSES St THROW Secondan	Present? Yes X No X No X OF ORGANIC GARBOUT PROFILE.
Type: Depth (Inches): marks: Soil IS MixE AINED FIME SAND DROLOGY Interpolation of the second of		heck all tha	at apply) Crust (B11)		AND MOIS	Hydric Soil F LENSES THROW Secondan Surface	Present? Yes X No X No X OF ORGANIC FILLOW TO PROFILE. VIndicators (minimum of two requires 2 Soil Cracks (B6)
Depth (inches): emarks: Soil IS Mixe TAINED FIME SAND DROLOGY etland Hydrology Indicators: mary Indicators (minimum of one , Surface Water (A1) , High Water Table (A2)		heck all tha Salt Aqu	at apply) Crust (B11 atic Inverte) brates ((B13)	AND y Mois	Hydric Soil F LENSES THROW Secondar Surfac Spars	Present? Yes X No X N
Type: Depth (inches): emarks: Soil IS Mixe TAINED FIME SAND DROLOGY etland Hydrology Indicators: mary Indicators (minimum of one Surface Water (A1) High Water Table (A2) Saturation (A3)		heck all tha Salt Aqu Hyd	at apply) Crust (B11 atic Inverte) brates ((B13) r (C1)	AND MOIS	Hydric Soil F LENSES St throw Secondar Surfac Spars Draina	Present? Yes X No X No X Present? Yes X No X No X Present? Yes X No X Present? Yes X No X No X Present? Yes X No X N
Type: Depth (inches): marks: Soil IS Mix & Ain ED Fine Sand DROLOGY etland Hydrology Indicators: mary Indicators (minimum of one Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1)		heck all tha Salt Aqu Hyd Dry-	at apply) Crust (B11 atic Inverte rogen Sulfii Season Wa) brates (de Odo ater Tat	(B13) r (C1) ple (C2)		Secondary Surfac Spars Draina Oxidiz	Present? Yes No No Present? Yes No No Present? Yes No No Present? Yes No No No Present? No No No Present? No No No Present? No
Type:		heck all tha Salt Aqu Hyd Dry- Oxio	at apply) Crust (B11 atic Inverte rogen Sulfii Season Wa	brates (de Odor ater Tat	(B13) r (C1) ple (C2)		Hydric Soil F LENSES + + + now Secondan _ Surfac _ Spars _ Draina _ Oxidiz Children (who	Present? Yes X No X No X OF CRETANIC FIFTON TO PROFICE. PINICATION TO PROFICE. PINICATOR (Minimum of two requires so Soil Cracks (B6) ely Vegetated Concave Surface (Bigge Patterns (B10) ed Rhizospheres on Living Roots (erre tilled)
Type:		heck all tha Salt Aqu Hyd Dry- Oxio	at apply) Crust (B11 atic Inverte rogen Sulfii Season Wa fized Rhizo) brates (de Odo ater Tat spheres	(B13) r (C1) ble (C2) s on Livin		Secondar Surfac Spars Draina Oxidiz Crayfii	Present? Yes X No X No X OF ORETANIC FIFTON TO PROFICE. Pulndicators (minimum of two require the Soil Cracks (B6) eley Vegetated Concave Surface (Bigge Patterns (B10) ed Rhizospheres on Living Roots (Pare tilled) sh Burrows (C8)
Type:		heck all that Salt Aqu Hyd Dry- Oxic (w Pres	at apply) Crust (B11 atic Inverte rogen Sulfii Season Wa lized Rhizo there not til	brates (de Odorater Tataspheres)	(B13) r (C1) ble (C2) s on Livin		Secondan Surfac Spars Draina Oxidiz Satura	Present? Yes No No OF ORGANIC FIFTON TO PROFIVE. Andicators (minimum of two require the Soil Cracks (B6) etg Patterns (B10) ed Rhizospheres on Living Roots (Patterns (B10)) etg Rhizospheres (C8)
Type:	e required; c	heck all that Salt Aqu Hyd Dry- Oxio (w Pres	at apply) Crust (B11 atic Inverte rogen Sulfii Season Wa fized Rhizo	brates (de Odo ater Tab spheres illed) duced lace (C7	(B13) r (C1) ple (C2) s on Livin liron (C4)		Secondan Surfac Spars Draina Oxidiz Crayfii Satura Geom	Present? Yes No No FORFIANIC FIFTON F PROFICE. Pulndicators (minimum of two require the Soil Cracks (B6) eley Vegetated Concave Surface (B6) gap Patterns (B10) ed Rhizospheres on Living Roots (Cere tilled) sh Burrows (C8)
Type:	e required; c	heck all that Salt Aqu Hyd Dry- Oxio (w Pres	at apply) Crust (B11 atic Inverte rogen Sulfii Season Wa dized Rhizo there not ti sence of Re Muck Surf	brates (de Odo ater Tab spheres illed) duced lace (C7	(B13) r (C1) ple (C2) s on Livin liron (C4)		Secondan Surfac Spars Oxidiz Crayfit Satura Geom FAC-N	Present? Yes No No Present? Yes No No Present? Yes No Present? No Present? No Present? No Present Pres
Depth (inches):	e required; c	heck all that Salt Aqu Hyd Dry- Oxio (w Pres	at apply) Crust (B11 atic Inverte rogen Sulfii Season Wa dized Rhizo there not ti sence of Re Muck Surf	brates (de Odo ater Tab spheres illed) duced lace (C7	(B13) r (C1) ple (C2) s on Livin liron (C4)		Secondan Surfac Spars Oxidiz Crayfit Satura Geom FAC-N	Present? Yes X No X X N
Depth (inches):	e required; c	heck all the Salt Aqu Hyd Dry- Oxic (w Pres Thin	at apply) Crust (B11 atic Inverte rogen Sulfii Season Wi dized Rhizo here not ti sence of Re Muck Surfier (Explain in	brates (de Odorater Tab spheres illed) educed lace (C7 in Rema	(B13) r (C1) ple (C2) s on Livin liron (C4)		Secondan Surfac Spars Oxidiz Crayfit Satura Geom FAC-N	Present? Yes X No X X N
Depth (inches):	e required; c	heck all that Salt Aqu Hyd Dry- Oxic (w Pres Thin	at apply) Crust (B11 attic Inverte rogen Sulfii Season Wi dized Rhizo here not ti tence of Re Muck Surfier (Explain i	brates (de Odor ater Tat spheres illed) duced l ace (C7 in Rema	(B13) r (C1) ple (C2) s on Livin liron (C4)		Secondan Surfac Spars Oxidiz Crayfit Satura Geom FAC-N	Present? Yes X No X X N
Depth (Inches):	e required; c	heck all that Salt Aqu Hyd Dry Oxic (w Pres Thin Othe	at apply) Crust (B11 alic Inverte rogen Sulfii Season Wa- dized Rhizo here not ti sence of Re Muck Surfi er (Explain i oth (inches)	brates (de Odorater Tataspheres (lled) aduced lace (C7 in Remail	(B13) r (C1) ole (C2) s on Livin lron (C4) r) arks)	g Roots (C	Secondan Surfac Spars Draina Oxidiz Satura Geom FAC-N Frost-I	Present? Yes X No X X N

Attachment N – Appendix D FACWet Data Forms

ADMINISTRATIVE CHARACTERIZATION 9/2/2012 WET 274-01 Evaluation: **General Information** WET 274-02 SoutH PLATTE RIVER I-70 EAST Site Name or ID: Project Name: 404 or Other Permit COOT Application #: Applicant Name: WETLAND SCIENTIST Evaluator's professional position and R. MELDOUNIEN Evaluator Name(s): organization: Location Information: Geographic South PLATTE AT I-70 Site Location WGS 84 Datum Used (Lat./Long. or UTM): - SEE MAPS 39.7795, -104.9777 1:24,000 1:100,000 COMMERCE City Map Scale: USGS Quadrangle (Circle one) Мар: Other 1: 10190003 - MIDDLE SOUTH PLATTE-CHERREN CRIC Wetland Sub basin Name (8 City of DENVER Ownership: digit HUC): Project Information: Potentially Impacted Wetlands Purpose of Mitigation; Pre-construction Evaluation Project Wetland Mitigation; Post-construction This evaluation is (check all Mitigation Site being performed at: Monitoring applicable): (Check applicable box) Other (Describe) ☐ Restortation Enhancement Creation Intent of Project: (Check all applicable) Total Size of Wetland Involved: × Measured GPS ac (Record Area, Check and Describe Estimated Measurement Method Used) Assessment Area (AA) Size (Record Measured ac. ac. ac. ac. Area, check appropriate box. Additional spaces ac. are used to record acreage when more than one AA is included in a single assessment) Estimated ac. ac. ac. WETCAMED DECIMENTION BOUNDAMY, THE AA INCLUDES TWO FRINGE WETCHINGS AD THEENT TO Characteristics or Method used for AA boundary determination: THE SOUTH PLATTE RIVER. Notes:

Special Concerns Check all that apply Organic soils including Histosols or Histic Epipedons are Federally threatened or endangered species are present in the AA (i.e., AA includes core fen habitat). SUSPECTED to occur in the AA? Project will directly impact organic soil portions of the AA including areas possessing either Histosol soils or histic epipedons. Species of concern according to the Colorado Natural Organic soils are known to occur anywhere within the

ECOLOGICAL DESCRIPTION 1

	Contiguous welland of which the AA is part.	Tiernage (Civili) are known to occar in the AA
J	The wetland is a habitat oasis in an otherwise dry or urbanized landscape?	The site is located within a potential conservation area or element occurrence buffer area as determined by CNHP?
	Federally threatened or endangered species are KNOWN to occur in the AA? List Below.	Other special concerns (please describe)
2001	HYDROGEOMOR	PHIC SETTING
<u> </u>	AA wetland maintains its fundamental natural hydrogeom	norphic characteristics
	AA wetland has been subject to change in HGM classes If the above is checked, please describe the original wetl	
٦	AA wetland was created from an upland setting.	

Describe the hydrogeomorphic setting of the wetland by circling all conditions **Current Conditions** that apply.

Water source	Surface flow	Groundwate	er Precipi	tation	Unknown
Hydrodynamics	Unidirectional	Vertical	Bi-direc	tional	
Wetland Gradient	0-2%	2-4%	4-10%	>10	1%
# Surface Inlets	Over-bank	0 1	2	3	>3
# Surface Outlets		0 1	2	3	>3
Geomorphic Setting (Narrative Description: Include approx. stream order for riverine)	WETGAND FRING ADJACENT 10 SETTING.	ak on ac South Pla	tive Floor	plain VER 11	I BENCH NI URBANI
HGM class	Riverine	Slope	Depress	sional	Lacustrine

Slope

Depressional

Lacustrine

Historical Conditions Water source Surface flow Groundwater Precipitation Unknown Unidirectional Hydrodynamics Vertical Previous SAME AS ABOVE, THOUGHT THE PLOOD PLANY WOMED Geomorphic HAVE BEEN MUCH BROADEN AND THE CHARMEL WOULD NOT BE CONFINED. wetland typology Setting (Narrative Previous HGM

Riverine

Notes (include information on the AA's HGM subclass and regional subclass):

Class

HGM Setting

ECOLOGICAL DESCRIPTION 2

Vegetation	Habitat De	escription	US FWS habitat class	sification according as reported	d in Cowardin et al. (19)	79).
System	Subsystem	Class	Subclass	Water Regime	Other Modifiers	% AA
PALUSTRINE	PALLISTRINA	: 55	BLDECIDNOUS	SEASONIALLY FLOGER	EXCAVATED	50
PALUSTAINE	PALLISTAINE	Em	PENSISTENIT	SEASONALLY FLORIED	EXCAVATED	50
_acustrine	Littoral; Limnoral		Flattermades	Examples	Hypersaline(7); Eusaline(8);	
Riverine	Palustrine Lower perennial; Upper perennial; Intermittent	Rock Bot. (RB) Uncon Bottom(UB) Aquatic Bed(AB) Rocky Shore(RS) Uncon Shore(US) Emergent(EM) Shrub-scrub(SS) Forested (FO)	Floating vascular; Rooted vascular; Algal; Persistent; Non-Persistent; Broad-leaved deciduous; Needle-leaved evergreen; Cobble - gravel; Sand; Mud; Organic	Temporarily flooded(A); Saturated(B); Seasonally flooded(C); Seasflood./sat.(E); Semi-Perm. flooded(F); Intermittently exposed(G); Artificially flooded(K); Sat./semiperm./Seas. (Y); Int. exposed/permenant(Z)	Mixosaline(9); Fresh(0); Acid(a); Circumneutral(c); Alkaline/calcareous(i); Organic(g); Mineral(n); Beaver(h); Partially Drained/ditched(d); Farmed(f); Diked/impounded(h); Artificial Substrate(r); Spoil(s); Excavated(x)	
Site Map		a sketch map of th ther significant feat		tions of the wetland, AA bound	dary, structures, habitat	classes
SEE	HACHED M	Ap				
						_

Variable 1: Habitat Connectivity - Neighboring Wetland Habitat Loss

This variable is a measure of how isolated from other naturally-occurring wetland or riparian habitat the AA has become as a result of the loss of that habitat. To score this variable, estimate the percent of naturally-occurring wetland/riparian habitat that has been lost (by filling, draining, development, or whatever means) within a 500-meter-wide belt surrounding the AA. This surrounding area is called the Habitat Connectivity Envelope (HCE). Historical photographs and NWI and hydric soils maps can be helpful in scoring this variable. In most cases the evaluator must use best professional judgment in estimating the amount of natural wetland loss. Evaluation of landforms and habitat patterns in the context of perceivable land use change should be used to steer estimates of the amount of wetland loss within the HCE. This variable is not meant to penalize AAs that are naturally isolated, or unique to the landscape. Rather, it should measure the degree to which natural habitat connectivity has been lost.

Rules for Scoring:

- 1. On the aerial photo, create a 500 meter perimeter around the AA.
- 2. The area within this perimeter is the Habitat Connectivity Envelope (HCE).
- 3. Within the HCE, outline the current extent of naturally occurring wetland and riparian habitat. Do not include habitats such as excavated ponds or reservoir induced fringe wetlands.
- 4. Outline the historical extent of wetland and riparian habitats (i.e., existing natural wetlands plus those that have been destroyed).
- Use your knowledge of the history of the area and evident land use change to identify where habitat losses have occurred. Additional research could be utilized to increase the accuracy of this estimate including consideration of floodplain maps, historical aerial photographs, etc.
- Calculate the area of existing and historical wetlands. Divide the area values to determine the percentage of naturally occurring wetland habitat that remains in the HCE, and determine the variable score using the guidelines below.

Variable Score	Condition Category	Scoring Guidelines
1.0 - 0.9	Reference Standard	Wetland losses are absent or negligible or there is no evidence to suggest the native landscape within the HCE historically contained other wetland habitats
<0.9 - 0.8	Highly Functioning	More than 80% of historical wetland habitat area within the HCE is still present (less than 20% of habitat area lost).
<0.8 - 0.7	Functioning	80 to 60% of historical wetland habitat area within the HCE is still present (20% to 40% of habitat area lost).
<0.7 - 0.6	Functioning Impaired	Less than 60 to 25% of historical wetland habitat area within the HCE is still present (more than 40 to 75% of habitat area lost).
<0.6	Non- functioning	Less than 25% of the historical wetland habitat area within the HCE still in existence (more than 70% of habitat lost).

<0.6	Non- functioning	Less than 25% of the historical wetland habitat area within the HCE still in existence (more than 70% of habitat lost).
		Variable 1 Score
otes: Onl Fruit	Site occu by wetler WHE ADJA	UNS IN A HIGHLY UNBANIZED SETTING WHERE HHE ANDS THAT OCCUR WITHIN HE HEE OCCUR AS A MENT TO THE RIVER.

Variable 2: Habitat Connectivity - Migration/Dispersal Barriers

This variable is intended to rate the degree to which the AA has become isolated from existing neighboring wetland and riparian habitat by artificial barriers that inhibit migration or dispersal of organisms. On the aerial photograph, identify the man-made barriers within the HCE that intercede between the AA and surrounding wetlands and riparian areas, and identify them by type on the stressor list. Score this variable based on the barriers' impermeability to migration and dispersal and the amount of surrounding wetland/riparian habitat they affect.

Rules for Scoring:

- 1. On the aerial photo, outline all existing wetland and riparian habitat areas within the HCE. This includes naturally occurring habitats as well as those purposefully created or induced by land use change.
- 2. Identify artificial barriers to dispersal and migration of organisms within the HCE that intercede between the AA and surrounding habitats. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.
- 3. Considering the composite effect of all of identified barriers to migration and dispersal (i.e., stressors), assign an overall variable score using the scoring guidelines.

1	Stressors	Comments/description
×	Major Highway	I-70 CROSSING OVER RIVER
×	Secondary Highway	OFFRAMOS FROM I-70
×	Tertiary Roadway	OFF RAMPS FROM I-70 ON FITHER SIDE OF RIVER
×	Railroad	BRIDGE
×	Bike Path	ADJACENT TO RIVER
×	Urban Development	DOWNTOWN DENVER
	Agricultural Development	
	Artificial Water Body	
	Fence	
	Ditch or Aqueduct	
	Aquatic Organism Barriers	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	Reference Standard	No appreciable barriers exist between the AA and other wetland and riparian habitats in the HCE; or there are no other wetland and riparian areas in the HCE.
<0.9 - 0.8	Highly Functioning	Barriers impeding migration/dispersal between the AA and up to 33% of surrounding wetland/riparian habitat highly permeable and easily passed by most organisms. Examples could include gravel roads, minor levees, ditches or barbed-wire fences. Mon significant barriers (see "functioning category below) could affect migration to up to 10% of surrounding wetland/riparian habitat.
<0.8 - 0.7	Functioning	Barriers to migration and dispersal retard the ability of many organisms/propagules to pass between the AA and up to 66% of wetland/riparian habitat. Passage of organisms and propagules through such barriers is still possible, but it may be constrained to certain times of day, be slow, dangerous or require additional travel. Busy two-lane roads, culverted areas, small to medium artificial water bodies or small earthen dams would commonly rate a score in this range. More significant barriers (see "functioning impaired category below) could affect migration to up to 10% of surrounding wetland/riparian habitat.
<0.7 - 0.6	Functioning Impaired	Barriers to migration and dispersal preclude the passage of some types of organisms/propagules between the AA and up to 66% of surrounding wetland/riparian habitat. Travel of those animals which can potential negotiate the barrier are strongly restricted and may include a high chance of mortality. Up to 33% of surrounding wetland/riparian habitat could be functionally isolated from the AA.
<0.6	Non-functioning	AA is essentially isolated from surrounding wetland/riparian habitat by impermeable migration and dispersal barriers. An interstate highway or concrete-lined water conveyance canal are examples of barriers which would generally create functional isolation between the AA and wetland/riparian habitat in the HCE.

Lots of BANGERS to DispersAL. ONly Variable 2: VIABLE DISPERSAL IS to HABITATS UP AND DOWNSTREAM ON THE SOUTH PLACE.

Variable 2 Score

Variable 3: Buffer Capacity

The buffer area is defined as a 250-meter-wide belt surrounding the perimeter of the AA. This variable is a measure of the capacity of that area to function as an effective buffer for the welland against the deleterious effects of surrounding land use change. To score the variable, assume that the AA is 100% buffered except where land use changes inside the buffer area have diminished this quality. Identify these land use types as specific stressors in the list. For each stressor, rate severity and extent within the buffer area, then use this list to make an overall rating for the buffer's departure from reference conditions. When rating buffer capacity, consider both the intensity of the impact and the proximity of the stressor to the AA.

Rules for Scoring:

- 1. On the aerial photograph, delimit the buffer area (BA) as the zone within 250 meters of the outer boundary of the
- 2. Use the stressor list to record land use changes that affect buffering capacity within the buffer area. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.
- 3. Considering all of the identified stressors, their composite severity, extent and proximity to the AA assign an overall variable score using the scoring guidelines.

1	Stressors	Comments/description
×	Industrial/commercial	PAILVANDS, FAST FOOD
×	Urban	ROADS, HIGHWAYS PARKING LOTS
" ×	Residential	HOUSING ANEAS
	Rural	
	Dryland Farming	
	Intensive Agriculture	
	Orchards or Nurseries	1,250,400
-	Livestock Grazing	
X	Transportation Corridor	
	Urban Parklands	
	Dams/impoundments	
	Artificial Water body	
	Physical Resource Extraction	
	Biological Resource Extraction	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	Reference Standard	No appreciable land use change has been imposed within the TBA and it provides the full buffering capacity.
<0.9 - 0.8	Highly Functioning	Some land use change has occurred in the BA, but such changes little impair the area's ability to provide a buffering function, either because land use is not intensive, for example haying, light grazing, or low intensity silviculture, or more substantial changes occur in approximately less than 10% of the BA.
<0.8 - 0.7	Functioning	BA has been subjected to a marked shift in land use, however, the land retains much of its original buffering capacity. Moderate-intensity land uses such as dry-land farming, urban "green" corridors, or moderate cattle grazing would commonly be placed within this scoring range.
<0.7 - 0.6	Functioning Impaired	Land use changes within the BA has been substantial including the a moderate to high coverage (up to 50%) of impermeable surfaces, bare soil, or other artificial surface; considerable in-flow urban runoff or fertilizer-rich waters common. While, the buffering capacity of the land has been greatly diminished it is not extinguished. Intensively logged areas, low-density urban developments, some urban parklands and some cropping situations would commonly rate a score within this range.
<0.6	Non-functioning	The area within the BA provides essentially no buffering capacity. Many Commercial developments or highly urban landscapes would rate a score of less than 0.6.

NOT BUFFEMED, DIRECT DISCHARGE FROM URBAN LANDSCAPE INTO RIVER AND ADJ. WETLANDS, Variable 3 score 0.0

Variable 4: Water Source

This variable is concerned with up-gradient hydrologic connectivity. It is a measure of the impacts to the AA's water source, including the ability of source water to perform work such as sediment transport, erosion, soil pore flushing, etc. To score this variable, identify stressors that alter the source of water to the AA, and record their presence on the stressor list. Stressors can impact water source by depletion, augmentation, or alteration of inflow timing or hydrodynamics. For riverine systems, this variable is primarily concerned with the connection of the channel to the floodplain. This variable is designed to assess water quantity, power and timing, not water quality. Water quality will be evaluated in Variable 8.

Scoring rules:

- 1. Use the stressor list and knowledge of the watershed to catalog type-specific impairments of the AA's water source. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.
- 2. Considering the composite effect of stressors on the water source, rate the condition of this variable with the aid of the scoring guidelines.

\checkmark	Stressors	Comments/description	
	Ditches or Drains (tile, etc.)		
X	Dams	CHATFIELD RESERVOIR	
	Diversions	10115	
	Groundwater pumping		
	Draw-downs		
	Culverts or Constrictions		
	Point Source (urban, ind., ag.)		
	Non-point Source		
	Increased Drainage Area		
7	Storm Drain/Urban Runoff	URBAN ENVIRONMENT URBAN DENVER	
X	Impermeable Surface Runoff	URBAN DENVER	
,	Irrigation Return Flows		
	Mining/Natural Gas Extraction		_
	Transbasin Diversion		
	Actively Managed Hydrology		

Variable Score	Condition Class	Depletion	Augmentation
1.0 - 0.9	Reference Standard	Unnatural drawdown events minor, rare or non- existent, very slight uniform depletion, or trivial alteration of hydrodynamics.	Unnatural high-water events minor, rare or non- existent, slight uniform increase in amount of inflow, or trivial alteration of hydrodynamics.
<0.9 - 0.8	Highly Functioning	Unnatural drawdown events occasional, short duration and/or mild; or uniform depletion up to 20%; or mild to moderate reduction of peak flows or capacity of water to perform work.	Occasional unnatural high-water events, short in duration and/or mild in intensity; or uniform augmentation up to 20%; or mild to moderate increase of peak flows or capacity of water to perform work.
<0.8 - 0.7	Functioning	Unnatural drawdown events common and of mild to moderate intensity and/or duration; or uniform depletion up to 50%; or moderate to substantial reduction of peak flows or capacity of water to perform work.	Common occurrence of unnatural high-water events, of a mild to moderate intensity and/or duration; or uniform augmentation up to 50%; or moderate to substantial increase of peak flows or capacity of water to perform work.
<0.7 - 0.6	Functioning Impaired	Unnatural drawdown events occur frequently with a moderate to high intensity and/or duration; or uniform depletion up to 75%; or substantial reduction of peak flows or capacity of water to perform work. Wetlands with actively managed or wholly artificial hydrology will usually score in this range or lower.	Common occurrence of unnatural high-water events, some of which may be severe in nature or exist for a substantial portion of the growing season; or uniform augmentation more than 50% or capacity of water to perform work. Wetlands with actively managed or wholly artificial hydrology will usually score in this range or lower.
<0.6	Non- functioning	Water source diminished enough to threaten or extinguish wetland hydrology in the AA.	Frequency, duration or magnitude of unnaturally high- water great enough to change the fundamental characteristics of the wetland.

THE WETLAMOS THAT EXIST HAVE DEVELOPED UNDER A COMPLETELY ARTIFICIAL SYSTEM.

Variable 4 Score

Variable 5: Water Distribution

This variable is concerned with hydrologic connectivity within the AA. It is a measure of alteration to the spatial distribution of surface and groundwater within the AA. These alterations are manifested as local changes to the hydrograph and generally result from geomorphic modifications. To score this variable, identify stressors that alter flow patterns and impact the hydrograph within the AA, including localized increases or decreases to the depth or duration of the water table or surface water. In most cases, the Water Source variable score will determine the maximum achievable score for Water Distribution, since the condition of the water source exerts a primary control on the wetland's capacity to distribute water in a characteristic fashion and exhibit a natural hydrograph.

Scoring rules:

- 1. Identify impacts to the natural distribution of water throughout the AA and catalog them in the stressor table.
- 2. Considering all of the stressors identified, assign an overall variable score using the scoring guidelines. In most cases, the Water Source variable score will set the upper limit for the Water Distribution score.

/	Stressors	Comments/description	
	Alteration of Water Source		
	Ditches		
	Ponding/Impoundment		
	Culverts		20-110-2000
	Road Grades		
	Channel Incision/Entrenchment		
	Hardened/Engineered Channel		
70	Enlarged Channel		
	Artificial Banks/Shoreline		
	Weirs		
	Dikes/Levees/Berms		
	Diversions		
	Sediment/Fill Accumulation		

Variable Score	Condition Class	Non-riverine	Riverine
1.0 - 0.9	Reference Standard	Little or no alteration has been made to the way in which water is distributed throughout the wetland. AA maintains a natural hydrologic regime.	Natural active floodplain areas flood on a normal recurrence interval. No evidence of alteration of flooding and subirrigation duration and intensity.
<0.9 - 0.8	Highly Functioning	Less than 10% of the AA is affected by in situ hydrologic alteration; or more widespread impacts result in less than a 2 in. (5 cm) change in mean growing season water table elevation.	Channel-adjacent areas have occasional unnatural periods of drying or flooding; or uniform shift in the hydrograph less than typical root depth.
<0.8 - 0.7	Functioning	Between 10 and 33% of the AA is affected by in situ hydrologic alteration; or more widespread impacts result in a 4 in. (5 cm) or less change in mean growing season water table elevation.	In channel-adjacent area, periods of drying or flooding are common; or uniform shift in the hydrograph near root depth.
<0.7 - 0.6	Functioning Impaired	33 to 66% of the AA is affected by in situ hydrologic alteration; or more widespread impacts result in a 6 in. (15 cm) or less change in mean growing season water table elevation. Water table behavior must still meet jurisdictional criteria to merit this rating.	Adjacent to the channel, unnatural periods of drying or flooding are the norm; or uniform shift in the hydrograph greater than root depth.
<0.6	Non-functioning	More than 66% of the AA is affected by hydrologic alteration which changes the fundamental functioning of the wetland system, generally exhibited as a conversion to upland or deep water habitat.	Historical active floodplain areas are almost never wetted from overbank flooding, and/or groundwater infiltration is effectively cut off.

0,5

Variable 6: Water Outflow

This variable is concerned with down-gradient hydrologic connectivity and the flow of water (transporting materials and energy) out of the AA. It is a measure of impacts that affect the hydrologic outflow of water including the passage of water through its normal low- and high-flow surface outlets, and infiltration/groundwater recharge. In some cases, alteration of evapotranspiration rates may be significant enough of a factor to consider in scoring. Score this variable by identifying stressors that impact the means by which water is exported from the AA. In Variable 5, the stressors were evaluated in light of their impact on water distribution within the AA. To evaluate this variable focus on the AA's ability to export water, energy and associated materials to habitats down-gradient of the AA. In most cases, the Water Source variable score will determine the maximum achievable score for Water Outflow, since the condition of the water source exerts a primary control over the wetland's capacity to export water and associated materials.

Scoring rules:

- 1. Identify impacts to the natural outflow of water from the AA and catalog them in the stressor table.
- 2.Considering all of the stressors identified, assign an overall variable score using the scoring guidelines. Take in to account the cumulative effect of stressors on the wetland's ability to export water and water-borne materials. In most cases the Water Source variable will set the upper limit for the Water Outflow score.

V	Stressors	Comments/description	
	Alteration of Water Source		
-	Ditches		
	Dikes/Levees		
	Road Grades		
- 5	Culverts		
	Diversions		
	Constrictions		
	Channel Incision/Entrenchment		
	Hardened/Engineered Channel		
	Artificial Stream Banks		
	Weirs		
	Confined Bridge Openings		

Variable Score	Condition Class	Scoring Guidelines		
1.0 - 0.9	Reference Standard	Stressors have little to no effect on the magnitude, timing or hydrodynamics of the AA water outflow regime.		
<0.9 - 0.8	Highly Functioning	High- or low-water outflows are mildly to moderately affected, but at intermediate ("normal") levels flow continues essentially unaltered in quantity or character.		
<0.8 - 0.7	Functioning	High- or low-water outflows are moderately affected, mild alteration of intermediate level outflow occurs; or hydrodynamics moderately affected.		
<0.7 - 0.6	Functioning Impaired	Outflow at all stages is moderately to highly impaired resulting in persistent flooding of portions of the AA or unnatural drainage; or outflow hydrodynamics severely disrupted.		
<0.6	Non-functioning	The natural outflow regime is profoundly impaired. Down-gradient hydrologic connection severed or nearly so. Alterations may cause widespread unnatural persistent flooding or dewatering of the wetland system.		

As FRINGE WETCHNIDS	HERE IS NO	IMPERIMENT	to unter out	tew.
Score is limited by	WHIER SOURCE	Varia	ble 6 Score	0.5

Variable 7: Geomorphology

This variable is a measure of the degree to which the geomorphic setting has been altered within the AA. Changes to the surface configuration and natural topography constitute stressors. Such stressors may be observed in the form of fill, excavation, diking, sedimentation due to absence of flushing floods, etc. In riverine systems geomorphic changes to stream channel should be considered if the channel is within the AA. Alterations may include bed surface changes (embeddedness or morphology changes), stream bank instability, and stream channel reconfiguration. Geomorphic changes are usually ultimately manifested as changes to wetland hydrology and water relations with vegetation. Geomorphic alteration can also directly affect soil properties, such as near-surface texture, and the welland chemical environment, such as the redox state or nutrient composition in the rooting zone. In rating this variable, do not include the resultant effects of geomorphic change; rather focus on the physical impacts within the footprint of the alteration. The effects of geomorphic change are addressed by other variables. All alterations to geomorphology should be evaluated including small-scale impacts such as pugging, hoof sheer, and sedimentation which constitute important, but not immediately apparent, impacts.

Scoring Rules:

Identify impacts to geomorphological setting and topography within the AA and record them on the stressor checklist.
 Considering all of the stressors identified, assign an overall variable score using the scoring guidelines.

/		Stressors	Comments
		Dredging/Excavation/Mining	
V	L	Fill, including dikes, road grades, etc	URBANIZATION OF RIVER CORRIDOR URBAN LANDSCAPE
V		Grading	URBAN LANDSCADE
	=	Compaction	
	e	Plowing/Disking	
	en	Excessive Sedimentation	
	O	Dumping	
		Hoof Shear/Pugging	
		Aggregate or Mineral Mining	
		Sand Accumulation	
		Channel Instability/Over Widening	
	Only	Excessive Bank Erosion	
V		Channelization	URBANIZATION - LOSS OF FLOUDDLAIN
V		Reconfigured Stream Channels	, , , , , , , , , , , , , , , , , , ,
V	ne	Artificial Banks/Shoreline	RIDRADOED BANKS
	an	Beaver Dam Removal	1 11
	5	Substrate Embeddedness	H- 1-XX-107-3-1
	M.	Lack or Excess of Woody Debris	

Variable Score	Condition Class	Scoring Guidelines		
1.0 - 0.9	Reference Standard	Topography essentially unaltered from the natural state, or alterations appear to have a minimal effect or wetland functioning and condition. Patch or microtopographic complexity may be slightly altered, but native plant communities are still supported.		
<0.9 - 0.8	Highly Functioning	Alterations to topography result in small but detectable changes to habitat conditions in some or all of the AA; or more severe impacts exist but affect less than 10% of the AA.		
<0.8 - 0.7	Functioning	Changes to AA topography may be pervasive but generally mild to moderate in severity. May include patches of more significant habitat alteration; or more severe alterations affect up to 20 % of the AA.		
<0.7 - 0.6	Functioning Impaired	At least one important surface type or landform has been eliminated or created; microtopography has been strongly impacted throughout most or all of the AA; or more severe alterations affect up to 50% of the AA. Evidence that widespread diminishment or alteration of native plant community exist due to physical habitat alterations. Most incidentally created wetland habitat such as that created by roadside ditches and the like would score in this range or lower.		
<0.6	Non- functioning	Pervasive geomorphic alterations have caused a fundamental change in site character and functioning, commonly resulting in a conversion to upland or deepwater habitat.		

FRINGE WETLANDS ARE GREATLY REDUCED Variable 7
IN SIZE AND FUNCTIONALITY DUE TO CHANNELIZATION SCORE
AND ENGINEERING CONTROL OF THE SOUTH PLATE.

Variable 8: Water and Soil Chemical Environment

This variable concerns the chemical environment of the soil and water media within the AA, including pollutants and water quality. The origin of pollutants may be in the AA or delivered from up-gradient or surrounding areas. Score this variable by listing indicators of chemical stress in the AA. Consider point source and non-point sources of pollution, as well as mechanical or hydrologic changes that alter the chemical environment. Because water quality frequently cannot be inferred directly, the presence of many stressors is identified via indirect indicators.

Scoring rules:

- 1. Stressors are grouped into categories which have a similar signature or set of causes.
- 2. Use the indicator list to identify each stressor impacting the chemical environment of the AA.
- 3. For each stressor category, determine the sub-variable score using the scoring guideline table provided on the second page of the scoring sheet.
- -If the AA is part of a water body that is recognized as impaired or recommended for TMDL development for one of the factors, then score that sub-variable 0.65 or lower.
- 4. Transcribe sub-variable scores to the following variable scoring page and compute the sum.
- 5. Determine the variable score by following the scoring guidelines.

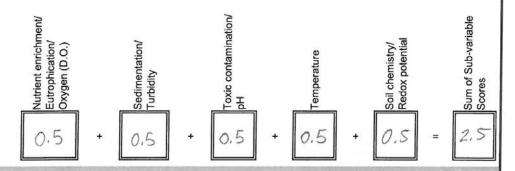
Stressor Indicator	1	Comments	Sub-
Livestock			variable
Agricultural Runoff			Score
Septic/Sewage		22.7.7.2.2	01
Excessive Algae or Aquatic Veg.			0.5
Cumulative Watershed NPS	V	UNBALLENY.	7
CDPHE Impairment/TMDL List	V	E. Coli, As	\exists /
Excessive Erosion	\vdash		- (
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			\dashv \
115 ATTA DESCRIPTION OF SECTION 1 SECTION DESCRIPTION	1		\dashv
	1		0.5
	1 1		
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	V		\dashv /
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Recent Chemical Spills			
Nearby Industrial Sites	V		
Road Drainage/Runoff	V		 \
Livestock			\neg
Agricultural Runoff			⊣ \
Storm Water Runoff	1/		4 -
Fish/Wildlife Impacts	. 5		0.5
Vegetation Impacts			
Cumulative Watershed NPS	V		\neg /
Acid Mine Drainage			\neg /
Point Source Discharge	V		\neg /
CDPHE Impairment/TMDL List	V		□ /
Metal staining on rocks and veg.			7
Excessive Temperature Regime			
Lack of Shading	V		
Reservoir/Power Plant Discharge			1
Industrial Discharge			0.5
Cumulative Watershed NPS	V		7 /
CDPHE Impairment/TMDL List			\Box /
Innatural Saturation/Desaturation	-		- K
	-	-	\dashv
			0.5
	\rightarrow		
CUPHE impairment I MUL List			1 /
	Agricultural Runoff Septic/Sewage Excessive Algae or Aquatic Veg. Cumulative Watershed NPS CDPHE Impairment/TMDL List Excessive Erosion Excessive Deposition Fine Sediment Plumes Agricultural Runoff Excessive Turbidity Nearby Construction Site Cumulative Watershed NPS CDPHE Impairment/TMDL List Recent Chemical Spills Nearby Industrial Sites Road Drainage/Runoff Livestock Agricultural Runoff Storm Water Runoff Fish/Wildlife Impacts Vegetation Impacts Cumulative Watershed NPS Acid Mine Drainage Point Source Discharge CDPHE Impairment/TMDL List Metal staining on rocks and veg. Excessive Temperature Regime Lack of Shading Reservoir/Power Plant Discharge Industrial Discharge	Livestock Agricultural Runoff Septic/Sewage Excessive Algae or Aquatic Veg. Cumulative Watershed NPS CDPHE Impairment/TMDL List Excessive Erosion Excessive Deposition Fine Sediment Plumes Agricultural Runoff Excessive Turbidity Nearby Construction Site Cumulative Watershed NPS CDPHE Impairment/TMDL List Recent Chemical Spills Nearby Industrial Sites Road Drainage/Runoff Livestock Agricultural Runoff Storm Water Runoff Fish/Wildlife Impacts Vegetation Impacts Cumulative Watershed NPS Acid Mine Drainage Point Source Discharge CDPHE Impairment/TMDL List Metal staining on rocks and veg. Excessive Temperature Regime Lack of Shading Reservoir/Power Plant Discharge Cumulative Watershed NPS CDPHE Impairment/TMDL List Unnatural Saturation/Desaturation Mechanical Soil Disturbance Dumping/introduced Soil	Livestock Agricultural Runoff Septic/Sewage Excessive Algae or Aquatic Veg. Cumulative Watershed NPS CDPHE Impairment/TMDL List Excessive Erosion Excessive Deposition Fine Sediment Plumes Agricultural Runoff Excessive Turbidity Nearby Construction Site Cumulative Watershed NPS CDPHE Impairment/TMDL List Recent Chemical Spills Nearby Industrial Sites Road Drainage/Runoff Livestock Agricultural Runoff Storm Water Runoff Fish/Wildlife Impacts Vegetation Impacts Cumulative Watershed NPS CUmulative Watershed NPS Acid Mine Drainage Point Source Discharge CDPHE Impairment/TMDL List Metal staining on rocks and veg. Excessive Temperature Regime Lack of Shading Reservoir/Power Plant Discharge Industrial Discharge Cumulative Watershed NPS CDPHE Impairment/TMDL List Unnatural Saturation/Desaturation Mechanical Soil Disturbance Dumping/introduced Soil

Variable 8: Water and Soil Chemical Environment

Sub-variable Scoring Guidelines

Variable Score	Condition Class	Scoring Guidelines Stress indicators not present or trivial.		
1.0 - 0.9	Reference Standard			
<0.9 - 0.8	Highly Functioning	Stress indicators scarcely present and mild, or otherwise not occurring in more than 10% of the AA.		
<0.8 - 0.7	Functioning	Stress indicators present at mild to moderate levels, or otherwise not occurring in more than 33% of the AA.		
<0.7 - 0.6	Functioning Impaired	Stress indicators present at moderate to high levels, or otherwise not occurring in more than 66% of the AA		
<0.6	Non-functioning	Stress indicators strongly evident throughout the AA at levels which apparently alter the fundamental chemical environment of the wetland system		

Input each factor score from the stressor list and calculate the sum.



Use the table to score the Chemical Environment Variable circling the applicable scoring rules.

Variable	Condition	Scoring Rules			
Score	Class	Single Factor		Composite Score	
1.0 - 0.9	Reference Standard	No single factor scores < 0.9	or	The factor scores sum > 4.5	
<0.9 - 0.8	Highly Functioning	Any single factor scores ≥ 0.8 but < 0.9	or	The factor scores sum >4.0 but ≤4.5	
<0.8 - 0.7	Functioning	Any single factor scores ≥ 7.0 but < 0.8	or	The factor scores sum >3.5 but ≤ 4.0	
<0.7 - 0.6	Functioning Impaired	Any single factor scores ≥ 0.6 but <0.7	or	The factor scores sum >3.0 but ≤3.5	
< 0.6	Non- functioning	Any single factor scores < 0.6	or	The factor scores sum < 3.0	

Variable 8 Score

0,5

Variable 9: Vegetation Structure and Complexity

This variable is a measure of the condition of the wetland's vegetation relative to its native state. It is particularly relevant to the wetland's ability to perform higher-order functions such as support of wildlife populations, although it also affects primary functions such as flood-flow attenuation. Score this variable by listing stressors that have affected the diversity, composition and cover of each vegetation cover class that would normally be present for the wetland type being assessed. For this variable, stressor severity is a measure of how much each vegetation stratum differs functionally from its natural condition.

Rules for Scoring:

- 1. Determine the number and types of vegetation layers present within the AA. Make a judgment as to whether additional layers were historically present using direct evidence such as stumps, root wads or historical photographs. Indirect evidence such as local knowledge and expert opinion can also be used in this determination. Check each present or suspected vegetation layer in the third row of the table.
- 2. Do not score vegetation layers that would not normally be present in the wetland type being assessed.
- Estimate the percent coverage of each vegetation layer. Aerial photographs can be helpful for this but are not required. In cases where a stratum has been thinned or removed, enter the expected coverage of that layer not the current percent coverage.
- 4. Enter the percent cover values as decimals in the row of the stressor table labeled "Percent Cover of Layer". Note, percentages will often sum to more than 100% (1.0).
- 5. Determine the severity of stressors acting on each individual canopy layers, indicating their presence with checks in the appropriate boxes of the stressor table.
- Determine the sub-variable score for each valid vegetation layer using the scoring guidelines on the second page of the scoring sheet. Enter each sub-variable score in the appropriate cell of the row labeled "Veg. Layer Sub-variable Score".
- 7. Add the "Veg. Layer Sub-variable Scores" and enter the sum in the labeled cell to the right of the individual scores, Follow this same process for the "Percent Cover of Layer".
- 8. Divide the sum of "Veg. Layer Sub-variable Scores" by the total coverage of all layers scored. This product is the Variable 9 score. Enter this number in the labeled box at the bottom of this page.

		Vegetatio	n Layers	;	
Layers Scored (check boxes to right to indicate scored layers)	/	V	/		
Stressor	Tree	Shrub	Herb	Aquatic	Comments
Noxious Weeds			-		
Exotic/Invasive spp.			V		
Tree Harvest		,			
Brush Cutting/Shrub Removal		V			
Livestock Grazing		'			
Excessive Herbivory					
Mowing/Haying		L-=			
Herbicide			/		
Loss of Zonation/Homogenization	V	1/	V		
Dewatering		,			42 = 3444 = 3
Over Saturation					
17/18 ANTIZATION	V	V	~		
Percent Cover of Layer	30 +	40 +	75 +		= 145
Veg. Layer Sub- variable Score	x 0,5	0.6	0.6	×	See sub-variable scoring guidelines on following page
Weighted Sub-variable Score	15+	24 +	45+		= 84
					Variable 9 Score

Sub-variable 9 Scoring Guidelines:
Based on the list of stressors identified above, rate the severity of their cumulative effect on vegetation structure and complexity for each vegetation layer.

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	Reference Standard	Stressors not present or with an intensity low enough as to not detectably affect the structure, diversity or composition of the vegetation layer.
<0.9 - 0.8	Highly Functioning	Stressors present at intensity levels sufficient to cause detectable, but minor, changes in layer composition. Stress related change should generally be less than 10% for any given attribute (e.g., 10% cover of invasive, 10% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as high as 33% for a given attribute if stressors are confined to patches comprising less than 10% of the wetland.
<0.8 - 0.7	Functioning	Stressors present with enough intensity to cause significant changes in the character of vegetation, including alteration of layer coverage, structural complexity and species composition. The vegetatic layer retains its essential character though. AA's with a high proportion of non-native grasses will commonly fall in this class. Stress related change should generally be less than 33% for any given attribute (e.g., 33% cover of invasive, 33% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as much as 66% for a given attribute if stressors are confined to patches comprising less than 25% of the wetland.
<0.7 - 0.6	Functioning Impaired	Stressor intensity severe enough to cause profound changes to the fundamental character of the vegetation layer. Stress-related change should generally be less than 66% for any given attribute (e.g., 66% cover of invasive, 66% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as much as 80% of a given attribute if stressors are confined to patches comprising less than 50% of the wetland.
<0.6	Non- functioning	Vegetation layer has been completely removed or altered to the extent that is no longer comparable to the natural structure, diversity and composition.

FACWet Score Card

VARIABLE SCORE TABLE

Scoring Procedure:

- 1. Transcribe variable scores from each variable data sheet to the corresponding cell in the variable score table.
- 2. In each Functional Capacity Index (FCI) equation, enter the corresponding variable scores in the equation cells. Do not enter values in the crossed cells lacking labels.
- 3. Add the variable scores to calculate the total functional points achieved for each function.
- 4. Divide the total functional points achieved by the functional points possible. The typical number of total points possible is provided, however, if a variable is added or subtracted to FCI equation the total possible points must be adjusted
- 5. Calculate the Composite FCI, by adding the FCI scores and dividing by the total number of functions scored (usually 7).
- 6. If scoring is done directly in the Excel spreadsheet, all values will be transferred and calculated automatically.

Variable 1: Habitat Connectivity - Neighboring Wetland Habitat Loss

	O.	
Variable 2: Habitat Connectivity - Migration/Dispersal Barriers Variable 3: Buffer Capacity	0.5	
ี ซี 💆 Variable 3: Buffer Capacity	0,0	
S Variable 4: Water Source	0.5	
Variable 4: Water Source Variable 5: Water Distribution Variable 6: Water Outflow	0,5	
Yariable 6: Water Outflow	0,5	
Variable 7: Geomorphology	0.4	
Variable 7: Geomorphology Variable 8: Chemical Environment Variable 9: Vegetation Structure and Complexity	0.5	
Variable 9: Vegetation Structure and Complexity	0.6	
Functional Capacity Indices		
Function 1 Support of Characteristic Wildlife Habitat Functional		Functional
$V1_{\text{welloss}}$ + $V2_{\text{barriers}}$ + $V3_{\text{buffer}}$ + $(2 \times V9_{\text{veg}})$ Points		Capacity
0,1 + 0,5 + 12.0 + 1,2 + + + = 1,8 +	÷ 5 =	0,360
Function 2 Support of Characteristic Fish/aquatic Habitat		
(3 x V4 _{source}) + (2 x V5 _{dist}) + 2 x V6 _{outflow} + V8 _{chem} + V7 _{geom}		
1.5 + 1.0 + 1.0 + 0.5 + 0.4 + = 4.4 =	÷ 9 =[0.489
Function 3 Flood Attenuation		
$V3_{\text{buffer}}$ + 2 x $V4_{\text{source}}$ + (2 x $V5_{\text{dist}}$) + 2 x $V6_{\text{outflow}}$ + $V7_{\text{geom}}$ + $V9_{\text{veg}}$	_	
0,0 + 1.0 + 1.0 + 1.0 + 0.4 + 0.6 = 4.0 +	÷9 =[0.444
Function 4 Short- and Long-term Water Storage		
V4 _{source} + (2 x V5 _{dist}) + 2 x V6 _{outflow}) V7 _{geom}	-	
0.5 + 1.0 + 1.0 + 0.4 + + = 2.9 ÷	- 6 = [0,483
Function 5 Nutrient/Toxicant Removal		
$(2 \times V5_{dist}) + V8_{chem} + V7_{geom}$	_	
1.0 + 0.5 + 0.4 + + + + = 1.9 ÷	- 4 =	0.475
Function 6 Sediment Retention/Shoreline Stabilization		
$V3_{buffer} + (2 \times V7_{geo}) + (2 \times V9_{veg})$		
0 + 0.8 + 1.2 + + + = 2.0 ÷	- 5 =	0,400
Function 7 Production Export/Food Chain Support		
$V1_{\text{welloss}} + 2 \times V6_{\text{outflow}} + V8_{\text{chem}} + V7_{\text{geo}} + (2 \times V9_{\text{veg}})$		
0.1 + 1.0 + 0.5 + 0.4 + 1.2 + = 3.2 +	7 = _	0.457
Sum of Individual FCI Sc	ores	3.109
Divide by the Number of Functions	Scored	÷ 7

Composite FCI Score

ADMINISTRATIVE CHARACTERIZATION

General Informat	ion	7	t 278-02	Date of Evaluation:	11/1/	Z		
Site Name or ID:	SANDO	REEK W	1E+278-11	Project Name:	Project Name: I - 70 EAST			
404 or Other Permit Application #:	_			Applicant Name:	CDOT			
Evaluator Name(s):	R.ME	Danney	/ Evaluator's profe	ssional position and organization:	WEHLANDSC ATICINS	<i>ientist</i>		
Location Informa	tion:							
Site Location (Lat./Long. or UTM):	Section Control Control	LEEK AT QUEBEC		Geographic Datum Used (NAD 83	WAS 84			
USGS Quadrangle Map:	Comme	RCE Cit	٧	Map Scale: (Circle one)	1:24,00 Other	0) 1:100,000 1:		
Sub basin Name (8 digit HUC):	10190003-	MIDDLE CHE	South Platte ERRY CREEK	Wetland Ownership:				
Project Information				7	pacted Wetlands			
This evaluation is being performed at: (Check applicable box)	X Project We		Purpose of Evaluation (check all applicable):	Mitigation; Pre Mitigation; Pos Monitoring Other (Describ	e-construction st-construction			
Intent of Project: (Chec	k all applicable	1	Restortation	☐ Enh	nancement	Creation		
Total Size of Wetland (Record Area, Check and Do Measurement Method Used)	escribe	ac.	✓ Measured (Estimated	GPS/GIS		4		
Assessment Area (AA) Area, check appropriate box. A		ac.	X Measured	ac.	ac. ac.	ac.		
are used to record acreage whe AA is included in a single asses		uo.	Estimated	ac.	ac. ac.	ас.		
Characteristics or Meth AA boundary determina		WETCAM INCLUDE OCCUIL A THE S	OBLINEAR S MULTIPLE/ DJ. 10 SANIF HAME STRE	ioni Bound Oulyflows B CRKAND SSORS.	ARY. THE A ECAUSE THE ARE SUBJ	TA Y AU Text TO		
Notes:								

ECOLOGICAL DESCRIPTION 1

Special Co	oncerns	Check all that apply						
	oils including Histosols of the AA (i.e., AA include:			Federally thre			ed species are	
	I directly impact organic areas possessing either		5					
	oils are known to occur a s wetland of which the A						he Colorado Natural cur in the AA?	
urbanized Federally t	nd is a habitat oasis in al landscape? threatened or endangere the AA? List Below.		_ {	The site is locarea or elemented by Other special	ent occurrer y CNHP?	nce buffer		
			g. 8 -					
1000000		YDROGEOMORF	PHIC	SETTIN	IG			
AA wetlan	d maintains its fundame	ental natural hydrogeomo	rphic	characterist	ics			
AA wetlan	d has been subject to c	change in HGM classes as escribe the original wetlar	s a re	sult of anthro	opogenic m			
	d was created from an		- 76		3	10-TH (10-14-10-10-10-10-10-10-10-10-10-10-10-10-10-		
		Describe the hydrogeom	orphi	c setting of t	he wetland	by circlin	ng all conditions	
Current Co	onditions	that apply.	and the last			> 555c PAS - 101		
	Water source	Surface flow	Gre	oundwater	Precipi	tation	Unknown	
	Hydrodynamics	Unidirectional	- 9	Vertical	Bi-direc	-directional		
	Wetland Gradient	(0-2%)		2-4%	4-10%	4-10% >10%		
	# Surface Inlets	Over-bank	0	1	2	3	>3	
HGM Setting	# Surface Outlets		0	1	2	3	>3	
TOM COLLING	Geomorphic Setting (Narrative Description. Include approx. stream order for riverine)	SAND CREEK	FI	oop la	in			
	HGM class	Riverine		Slope	Depress	sional	Lacustrine	
listorical Co	nditions							
	Water source	Surface flow	Gro	undwater	Precipit	ation	Unknown	
	Hydrodynamics	Unidirectional	١	/ertical				
Previous etland typology	Geomorphic Setting (Narrative	SAND CREEK	Flo	peoplar	×.			
	Previous HGM Class	Riverine		Slope	Depress	ional	Lacustrine	
lotes (include in	formation on the AA's H	HGM subclass and region	al sub	oclass):				

ECOLOGICAL DESCRIPTION 2

Vegetatio	n Habitat D	escription	US FWS habitat classification according as reported in Cowardin et al. (1979).						
System	Subsystem	Class	Subclass	Water Regime	Other Modifiers	% AA			
PALUSTRINE	PALUSTRINE	EM	PERSISTENT	B,C		25			
Palustnine	Palustrime	. 55	BL-DEGIDNOUS	B, C	_	75			
			1						
Lacustrine	Littoral; Limnoral			Examples	Hypersaline(7) ; Eusaline(8);				
Palustrine	Palustrine	Rock Bot. (RB) Uncon Bottom(UB)	Floating vascular; Rooted vascular;	Temporarily flooded(A); Saturated(B);	Mixosaline(9); Fresh(0); Acid(a);				
	Lower perennial; Upper perennial; Intermittent	Aquatic Bed(AB) Rocky Shore(RS) Uncon Shore(US) Emergent(EM) Shrub-scrub(SS) Forested (FO)	Algal; Persistent; Non-Persistent; Broad-leaved deciduous; Needle-leaved evergreen; Cobble - gravel; Sand; Mud; Organic	Seasonally flooded(C); Seasflood_/sat.(E); Semi-Perm. flooded(F); Intermittently exposed(G); Artificially flooded(K); Sat./semiperm./Seas. (Y); Int. exposed/permenant(Z)	Circumneutral(c); Alkaline/calcareous(i); Organic(g); Mineral(n); Beaver(b); Partially Drained/ditched(d); Farmed(f); Diked/impounded(h); Artificial Substrate(r); Spoil(s); Excavated(x)				

Site Map Scale: 1 sq. =			Drav and	Draw a sketch map of the site including relevant portions of the wetland, AA boundary, structures, habitat classes, and other significant features. SEE AERIAL MAP.																		
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		_																				
																						T
		+	+	1				+-		-					\vdash				_			\vdash
-			+	+			-	+			-		-	-	\vdash	\vdash	-					\vdash
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7	7																7					
_	_																	_				_

Variable 1: Habitat Connectivity - Neighboring Wetland Habitat Loss

This variable is a measure of how isolated from other naturally-occurring wetland or riparian habitat the AA has become as a result of the loss of that habitat. To score this variable, estimate the percent of naturally-occurring wetland/riparian habitat that has been lost (by filling, draining, development, or whatever means) within a 500-meter-wide belt surrounding the AA. This surrounding area is called the Habitat Connectivity Envelope (HCE). Historical photographs and NWI and hydric soils maps can be helpful in scoring this variable. In most cases the evaluator must use best professional judgment in estimating the amount of natural wetland loss. Evaluation of landforms and habitat patterns in the context of perceivable land use change should be used to steer estimates of the amount of wetland loss within the HCE. This variable is not meant to penalize AAs that are naturally isolated, or unique to the landscape. Rather, it should measure the degree to which natural habitat connectivity has been lost.

Rules for Scoring:

- 1. On the aerial photo, create a 500 meter perimeter around the AA.
- 2. The area within this perimeter is the Habitat Connectivity Envelope (HCE).
- 3. Within the HCE, outline the current extent of naturally occurring wetland and riparian habitat. Do not include habitats such as excavated ponds or reservoir induced fringe wetlands.
- 4. Outline the historical extent of wetland and riparian habitats (i.e., existing natural wetlands plus those that have been destroyed).
- Use your knowledge of the history of the area and evident land use change to identify where habitat losses have occurred. Additional research could be utilized to increase the accuracy of this estimate including consideration of floodplain maps, historical aerial photographs, etc.
- 5. Calculate the area of existing and historical wetlands. Divide the area values to determine the percentage of naturally occurring wetland habitat that remains in the HCE, and determine the variable score using the guidelines below.

Variable Score	Condition Category	Scoring Guidelines
1.0 - 0.9	Reference Standard	Wetland losses are absent or negligible or there is no evidence to suggest the native landscape within the HCE historically contained other wetland habitats
<0.9 - 0.8	Highly Functioning	More than 80% of historical wetland habitat area within the HCE is still present (less than 20% of habitat area lost).
<0.8 - 0.7	Functioning	80 to 60% of historical wetland habitat area within the HCE is still present (20% to 40% of habitat area lost).
<0.7 - 0.6	Functioning Impaired	Less than 60 to 25% of historical wetland habitat area within the HCE is still present (more than 40 to 75% of habitat area lost).
<0.6	Non- functioning	Less than 25% of the historical wetland habitat area within the HCE still in existence (more than 70% of habitat lost).

Variable 1 Score | 0.65

URBAN SETTING WHENE AU OF THE RIPARIAN/WETLAND
HABITAT THAT MAY HAVE NATURALLY OCCURNED AWAY FROM
SAND CREEK HAS BEEN CONVENTED AND THE RIPARIAN/WETLAND HABITAT Along SAND CREEK HAS BEEN SUBSTANTIALLY

REDUCED.

Variable 2: Habitat Connectivity - Migration/Dispersal Barriers

This variable is intended to rate the degree to which the AA has become isolated from existing neighboring wetland and riparian habitat by artificial barriers that inhibit migration or dispersal of organisms. On the aerial photograph, identify the man-made barriers within the HCE that intercede between the AA and surrounding wetlands and riparian areas, and identify them by type on the stressor list. Score this variable based on the barriers' impermeability to migration and dispersal and the amount of surrounding wetland/riparian habitat they affect.

Rules for Scoring:

- 1. On the aerial photo, outline all existing wetland and riparian habitat areas within the HCE. This includes naturally occurring habitats as well as those purposefully created or induced by land use change.
- 2. Identify artificial barriers to dispersal and migration of organisms within the HCE that intercede between the AA and surrounding habitats. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.
- Considering the composite effect of all of identified barriers to migration and dispersal (i.e., stressors), assign an overall variable score using the scoring guidelines.

Г	1	Stressors	Comments/description
l "	V	Major Highway	I-70
ie.	V	Secondary Highway	QUINCY AIR BRIDGE
arr	V	Tertiary Roadway	
0		Railroad	
artificial	V	Bike Path	BIKE PATH
#	V	Urban Development	SURROUMDS SITE
	-	Agricultural Development	
l s		Artificial Water Body	
ķ		Fence	
ess		Ditch or Aqueduct	
Stressors		Aquatic Organism Barriers	
"	V	CHECK DAMS	CHECK DAME W/ GROWTER RIPRAP LIKE PREVENT
			UDSTREAM MIGRATIONS OF AQUATIC ORG.

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	Reference Standard	No appreciable barriers exist between the AA and other wetland and riparian habitats in the HCE; or there are no other wetland and riparian areas in the HCE.
<0.9 - 0.8	Highly Functioning	Barriers impeding migration/dispersal between the AA and up to 33% of surrounding wetland/riparian habitat highly permeable and easily passed by most organisms. Examples could include gravel roads, minor levees, ditches or barbed-wire fences. More significant barriers (see "functioning category below) could affect migration to up to 10% of surrounding wetland/riparian habitat.
<0.8 - 0.7	Functioning	Barriers to migration and dispersal retard the ability of many organisms/propagules to pass between the AA and up to 66% of wetland/riparian habitat. Passage of organisms and propagules through such barriers is still possible, but it may be constrained to certain times of day, be slow, dangerous or require additional travel. Busy two-lane roads, culverted areas, small to medium artificial water bodies or small earthen dams would commonly rate a score in this range. More significant barriers (see "functioning impaired category below) could affect migration to up to 10% of surrounding wetland/riparian habitat.
<0.7 - 0.6	Functioning Impaired	Barriers to migration and dispersal preclude the passage of some types of organisms/propagules between the AA and up to 66% of surrounding wetland/riparian habitat. Travel of those animals which can potential negotiate the barrier are strongly restricted and may include a high chance of mortality. Up to 33% of surrounding wetland/riparian habitat could be functionally isolated from the AA.
<0.6	Non-functioning	AA is essentially isolated from surrounding wetland/riparian habitat by impermeable migration and dispersal barriers. An interstate highway or concrete-lined water conveyance canal are examples of barriers which would generally create functional isolation between the AA and wetland/riparian habitat in the HCE.

CONNECTIVITY IS ONLY UP AND DOWNSMEAN, Along SAND CREEK.

Variable 2 Score

Variable 3: Buffer Capacity

The buffer area is defined as a 250-meter-wide belt surrounding the perimeter of the AA. This variable is a measure of the capacity of that area to function as an effective buffer for the wetland against the deleterious effects of surrounding land use change. To score the variable, assume that the AA is 100% buffered except where land use changes inside the buffer area have diminished this quality. Identify these land use types as specific stressors in the list. For each stressor, rate severity and extent within the buffer area; then use this list to make an overall rating for the buffer's departure from reference conditions. When rating buffer capacity, consider both the intensity of the impact and the proximity of the stressor to the AA.

Rules for Scoring:

- 1. On the aerial photograph, delimit the buffer area (BA) as the zone within 250 meters of the outer boundary of the AA.
- 2. Use the stressor list to record land use changes that affect buffering capacity within the buffer area. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.
- Considering all of the identified stressors, their composite severity, extent and proximity to the AA assign an overall variable score using the scoring guidelines.

1	Stressors	Comments/description
1/	Industrial/commercial	Hotels
"V	Urban	ROADS, PARKING LOTS
	Residential	CONDOMINIMMS
	Rural	
	Dryland Farming	
	Intensive Agriculture	
	Orchards or Nurseries	
	Livestock Grazing	
V	Transportation Corridor	I-70 HIGHWAY
V	Urban Parklands	AA IS A GREELINAY WITH A BIKE PATH
V	Dams/impoundments	CHECK DAMS W/ GROWTED RIPRAD
	Artificial Water body	
	Physical Resource Extraction	
	Biological Resource Extraction	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	Reference Standard	No appreciable land use change has been imposed within the TBA and it provides the full buffering capacity.
<0.9 - 0.8	Highly Functioning	Some land use change has occurred in the BA, but such changes little impair the area's ability to provide a buffering function, either because land use is not intensive, for example haying, light grazing, or low intensity silviculture, or more substantial changes occur in approximately less than 10% of the BA.
<0.8 - 0.7	Functioning	BA has been subjected to a marked shift in land use, however, the land retains much of its original buffering capacity. Moderate-intensity land uses such as dry-land farming, urban "green" corridors, or moderate cattle grazing would commonly be placed within this scoring range.
<0.7 - 0.6	Functioning Impaired	Land use changes within the BA has been substantial including the a moderate to high coverage (up to 50%) of impermeable surfaces, bare soil, or other artificial surface; considerable in-flow urban runoff or fertilizer-rich waters common. While, the buffering capacity of the land has been greatly diminished it is not extinguished. Intensively logged areas, low-density urban developments, some urban parklands and some cropping situations would commonly rate a score within this range.
<0.6	Non-functioning	The area within the BA provides essentially no buffering capacity. Many Commercial developments or highly urban landscapes would rate a score of less than 0.6.

DEVELOPMENT DOES NOT FOU RIGHT UP TO SANIO CREEK, SO THERE IS SOME BUFFER CAPACITY.

Variable 3 score

Variable 4: Water Source

This variable is concerned with up-gradient hydrologic connectivity. It is a measure of the impacts to the AA's water source, including the ability of source water to perform work such as sediment transport, erosion, soil pore flushing, etc. To score this variable, identify stressors that alter the source of water to the AA, and record their presence on the stressor list. Stressors can impact water source by depletion, augmentation, or alteration of inflow timing or hydrodynamics. For riverine systems, this variable is primarily concerned with the connection of the channel to the floodplain. This variable is designed to assess water quantity, power and timing, not water quality. Water quality will be evaluated in Variable 8.

- 1. Use the stressor list and knowledge of the watershed to catalog type-specific impairments of the AA's water source. Mark the stressors present with a check in the first column and describe the general nature, seventy and extent of each. List additional stressors in empty rows at the bottom of the table and explain.
- 2. Considering the composite effect of stressors on the water source, rate the condition of this variable with the aid of the scoring guidelines.

1	Stressors	Comments/description
	Ditches or Drains (tile, etc.)	
V	Dams	QUINCY RESERVOIR OCCURS ON A TRIB. TO SAZED (RIK
	Diversions	
	Groundwater pumping	
	Draw-downs	
V	Culverts or Constrictions	BRIDGES
~	Point Source (urban, ind., ag.)	
V	Non-point Source	
	Increased Drainage Area	
V	Storm Drain/Urban Runoff	
V	Impermeable Surface Runoff	UNBAN ENV. FOR most of its WATERSHED W/S FROM AA
	Irrigation Return Flows	
	Mining/Natural Gas Extraction	
	Transbasin Diversion	
	Actively Managed Hydrology	

Variable Score	Condition Class	Depletion	Augmentation
1.0 - 0.9	Reference Standard	Unnatural drawdown events minor, rare or non- existent, very slight uniform depletion, or trivial alteration of hydrodynamics.	Unnatural high-water events minor, rare or non- existent, slight uniform increase in amount of inflow, or trivial alteration of hydrodynamics.
<0.9 - 0.8	Highly Functioning	Unnatural drawdown events occasional, short duration and/or mild; or uniform depletion up to 20%; or mild to moderate reduction of peak flows or capacity of water to perform work.	Occasional unnatural high-water events, short in duration and/or mild in intensity; or uniform augmentation up to 20%; or mild to moderate increase of peak flows or capacity of water to perform work.
<0.8 - 0.7	Functioning	Unnatural drawdown events common and of mild to moderate intensity and/or duration; or uniform depletion up to 50%; or moderate to substantial reduction of peak flows or capacity of water to perform work.	Common occurrence of unnatural high-water events, of a mild to moderate intensity and/or duration; or uniform augmentation up to 50%; or moderate to substantial increase of peak flows or capacity of water to perform work.
<0.7 - 0.6	Unnatural drawdown events occur frequently with a moderate to high intensity and/or duration; or uniform depletion up to 75%; or substantial reduction of peak flows or capacity of water to perform work. Wetlands with actively managed or wholly artificial hydrology will usually score in this range or		Common occurrence of unnatural high-water events, some of which may be severe in nature or exist for a substantial portion of the growing season; or uniform augmentation more than 50% or capacity of water to perform work. Wetlands with actively managed or wholly artificial hydrology will usually score in this range or lower.
<0.6	Non- functioning	Water source diminished enough to threaten or extinguish wetland hydrology in the AA,	Frequency, duration or magnitude of unnaturally high- water great enough to change the fundamental characteristics of the wetland.

IMPERMENTILE SURFACES ARE THE BIRGEST ISSUE -INCREASE IN Flow Volumes AND FLASHINESS OF

Variable 4 Score 0,65

Variable 5: Water Distribution

This variable is concerned with hydrologic connectivity within the AA. It is a measure of alteration to the spatial distribution of surface and groundwater within the AA. These alterations are manifested as local changes to the hydrograph and generally result from geomorphic modifications. To score this variable, identify stressors that alter flow patterns and impact the hydrograph within the AA, including localized increases or decreases to the depth or duration of the water table or surface water. In most cases, the Water Source variable score will determine the maximum achievable score for Water Distribution, since the condition of the water source exerts a primary control on the wetland's capacity to distribute water in a characteristic fashion and exhibit a natural hydrograph.

Scoring rules:

- 1. Identify impacts to the natural distribution of water throughout the AA and catalog them in the stressor table.
- 2. Considering all of the stressors identified, assign an overall variable score using the scoring guidelines. In most cases, the Water Source variable score will set the upper limit for the Water Distribution score.

1	Stressors	Comments/description
	Alteration of Water Source	
	Ditches	
	Ponding/Impoundment	
	Culverts	
	Road Grades	
V	Channel Incision/Entrenchment	MODERATE AMOUNT, HAS LANGRLY BEEN ADDRESS EN BY CHE
V	Hardened/Engineered Channel	CHECK DAM WITH GROWTED RIDRAD ADRONS
V	Enlarged Channel	Likely
	Artificial Banks/Shoreline	
	Weirs	
\vee	Dikes/Levees/Berms	IN the Vicinial of BRIDGES
	Diversions	The state of the s
	Sediment/Fill Accumulation	

Variable Score	Condition Class	Non-riverine	Riverine	
1.0 - 0.9	Reference Standard	Little or no alteration has been made to the way in which water is distributed throughout the wetland. AA maintains a natural hydrologic regime.	Natural active floodplain areas flood on a normal recurrence interval. No evidence of alteration of flooding and subirrigation duration and intensity.	
<0.9 - 0.8	Highly Functioning	Less than 10% of the AA is affected by in situ hydrologic alteration; or more widespread impacts result in less than a 2 in. (5 cm) change in mean growing season water table elevation.	Channel-adjacent areas have occasional unnatural periods of drying or flooding; or uniform shift in the hydrograph less than typical root depth.	
Between 10 and 33% of the AA is affer in situ hydrologic alteration; or more widespread impacts result in a 4 in. (5		widespread impacts result in a 4 in. (5 cm) or less change in mean growing season water	flooding are common; or uniform shift in the or hydrograph near root depth.	
<0.7 - 0.6	hydrologic alteration; or more widespread impacts result in a 6 in. (15 cm) or less		Adjacent to the channel, unnatural periods of drying or flooding are the norm; or uniform shift in the hydrograph greater than root depth.	
<0.6	Non-functioning	More than 66% of the AA is affected by hydrologic alteration which changes the fundamental functioning of the wetland system, generally exhibited as a conversion to	Historical active floodplain areas are almost never wetted from overbank flooding, and/or groundwater infiltration is effectively cut off.	

upland or deep water habitat.

MOSTY IN FLUENCIES BY WATER SOUNCE Variable 5 Score

0.65

KOAMS.

Variable 6: Water Outflow

This variable is concerned with down-gradient hydrologic connectivity and the flow of water (transporting materials and energy) out of the AA. It is a measure of impacts that affect the hydrologic outflow of water including the passage of water through its normal low- and high-flow surface outlets, and infiltration/groundwater recharge. In some cases, alteration of evapotranspiration rates may be significant enough of a factor to consider in scoring. Score this variable by identifying stressors that impact the means by which water is exported from the AA. In Variable 5, the stressors were evaluated in light of their impact on water distribution within the AA. To evaluate this variable focus on the AA's ability to export water, energy and associated materials to habitats down-gradient of the AA. In most cases, the Water Source variable score will determine the maximum achievable score for Water Outflow, since the condition of the water source exerts a primary control over the wetland's capacity to export water and associated materials.

Scoring rules:

- 1. Identify impacts to the natural outflow of water from the AA and catalog them in the stressor table.
- 2.Considering all of the stressors identified, assign an overall variable score using the scoring guidelines. Take in to account the cumulative effect of stressors on the wetland's ability to export water and water-borne materials. In most cases the Water Source variable will set the upper limit for the Water Outflow score.

V	Stressors	Comments/description
	Alteration of Water Source	
	Ditches	
	Dikes/Levees	
	Road Grades	
	Culverts	
	Diversions	
	Constrictions	
V	Channel Incision/Entrenchment	MODERATE AMOUNT
V	Hardened/Engineered Channel	CHECK DAMS W/ GROWTED RIPRAP
V	Artificial Stream Banks	SOME RIDRAPPIED BANKS
	Weirs	1 11
V	Confined Bridge Openings	

Variable Score	Condition Class	Scoring Guidelines			
1.0 - 0.9	Reference Standard	Stressors have little to no effect on the magnitude, timing or hydrodynamics of the AA water outflow regime.			
<0.9 - 0.8	Highly Functioning	High- or low-water outflows are mildly to moderately affected, but at intermediate ("normal") levels flow continues essentially unaltered in quantity or character.			
<0.8 - 0.7	Functioning	High- or low-water outflows are moderately affected, mild alteration of intermediate level outflow occurs; or hydrodynamics moderately affected.			
<0.7 - 0.6	Functioning Impaired	Outflow at all stages is moderately to highly impaired resulting in persistent flooding of portions of the AA or unnatural drainage; or outflow hydrodynamics severely disrupted.			
<0.6	Non-functioning	The natural outflow regime is profoundly impaired. Down-gradient hydrologic connection severed or nearly so. Alterations may cause widespread unnatural persistent flooding or dewatering of the wetland system.			

MOSTLY AFFECTED BY WATER SOURCE.

Variable 6 Score

0,65

Variable 7: Geomorphology

This variable is a measure of the degree to which the geomorphic setting has been altered within the AA. Changes to the surface configuration and natural topography constitute stressors. Such stressors may be observed in the form of fill, excavation, diking, sedimentation due to absence of flushing floods, etc. In riverine systems geomorphic changes to stream channel should be considered if the channel is within the AA. Alterations may include bed surface changes (embeddedness or morphology changes), stream bank instability, and stream channel reconfiguration. Geomorphic changes are usually ultimately manifested as changes to wetland hydrology and water relations with vegetation. Geomorphic alteration can also directly affect soil properties, such as near-surface texture, and the wetland chemical environment, such as the redox state or nutrient composition in the rooting zone. In rating this variable, do not include the resultant effects of geomorphic change, rather focus on the physical impacts within the footprint of the alteration. The effects of geomorphic change are addressed by other variables. All alterations to geomorphology should be evaluated including small-scale impacts such as pugging, hoof sheer, and sedimentation which constitute important, but not immediately apparent, impacts.

Scoring Rules:

- 1. Identify impacts to geomorphological setting and topography within the AA and record them on the stressor checklist.
- 2. Considering all of the stressors identified, assign an overall variable score using the scoring guidelines.

/	1	Stressors	Comments
	Г	Dredging/Excavation/Mining	
V	Î.	Fill, including dikes, road grades, etc	
V	r	Grading	
	<u>=</u>	Compaction	
	1 5	Plowing/Disking	
	1 5	Excessive Sedimentation	
	اه	Dumping	
	1	Hoof Shear/Pugging	
	1	Aggregate or Mineral Mining	
		Sand Accumulation	
V		Channel Instability/Over Widening	LIKELY
	nly	Excessive Bank Erosion	
	ō	Channelization	
V	100	Reconfigured Stream Channels	CHECK DAMS WI GROWTED RIDERD
V	ne	Artificial Banks/Shoreline	SHULT SPGIMENTS OF RIPRAD
	an	Beaver Dam Removal	
	S	Substrate Embeddedness	
		Lack or Excess of Woody Debris	

Variable Score	Condition Class	Scoring Guidelines			
1.0 - 0.9	Reference Standard	Topography essentially unaltered from the natural state, or alterations appear to have a minimal effect or wetland functioning and condition. Patch or microtopographic complexity may be slightly altered, but native plant communities are still supported.			
<0.9 - 0.8	Highly Functioning	Alterations to topography result in small but detectable changes to habitat conditions in some or all of the AA; or more severe impacts exist but affect less than 10% of the AA.			
<0.8 - 0.7	Functioning	Changes to AA topography may be pervasive but generally mild to moderate in severity. May include patches of more significant habitat alteration; or more severe alterations affect up to 20 % of the AA.			
<0.7 - 0.6	Functioning Impaired	At least one important surface type or landform has been eliminated or created; microtopography has been strongly impacted throughout most or all of the AA; or more severe alterations affect up to 50% of the AA. Evidence that widespread diminishment or alteration of native plant community exist due to physical habitat alterations. Most incidentally created wetland habitat such as that created by roadside ditches and the like would score in this range or lower.			
<0.6	Non- functioning	Pervasive geomorphic alterations have caused a fundamental change in site character and functioning, commonly resulting in a conversion to upland or deepwater habitat.			

CONSTRUCTIONS AND loss OF FLOODPLAIN AND ALTERNATIONS CAUSED BY INC. WATER FLOOD THE MAIN REASONS FOR HIS RATING,

Variable 7 Score

Variable 8: Water and Soil Chemical Environment

This variable concerns the chemical environment of the soil and water media within the AA, including pollutants and water quality. The origin of pollutants may be in the AA or delivered from up-gradient or surrounding areas. Score this variable by listing indicators of chemical stress in the AA. Consider point source and non-point sources of pollution, as well as mechanical or hydrologic changes that alter the chemical environment. Because water quality frequently cannot be inferred directly, the presence of many stressors is identified via indirect indicators.

Scoring rules

- 1. Stressors are grouped into categories which have a similar signature or set of causes.
- 2. Use the indicator list to identify each stressor impacting the chemical environment of the AA.
- 3. For each stressor category, determine the sub-variable score using the scoring guideline table provided on the second page of the scoring sheet.
- -If the AA is part of a water body that is recognized as impaired or recommended for TMDL development for one of the factors, then score that sub-variable 0.65 or lower.
- 4. Transcribe sub-variable scores to the following variable scoring page and compute the sum.
- 5. Determine the variable score by following the scoring guidelines.

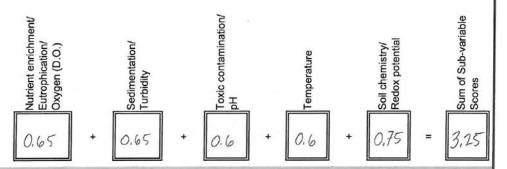
Stressor Category	Stressor Indicator	1	Comments	Sub-
	Livestock			variable
	Agricultural Runoff			Score
Nutrient Enrichment/	Septic/Sewage			615
Eutrophication/	Excessive Algae or Aquatic Veg.			0.65
Oxygen (D.O.)	Cumulative Watershed NPS	V		_ /
	CDPHE Impairment/TMDL List	/	E. Coli	\exists /
	Excessive Erosion			- (
	Excessive Deposition			\neg \
	Fine Sediment Plumes			\neg
Sedimentation/	Agricultural Runoff			
	Excessive Turbidity			0,65
Turbidity	Nearby Construction Site	V		
	Cumulative Watershed NPS	V		7/
	CDPHE Impairment/TMDL List			\exists /
	Recent Chemical Spills			- (
	Nearby Industrial Sites	1		
	Road Drainage/Runoff	V		\dashv \
	Livestock			 1
	Agricultural Runoff			\dashv \
T	Storm Water Runoff			
Toxic contamination/	Fish/Wildlife Impacts			0.6
pН	Vegetation Impacts			
	Cumulative Watershed NPS			\dashv /
	Acid Mine Drainage			\dashv /
	Point Source Discharge			\exists /
	CDPHE Impairment/TMDL List		Se	⊣/
	Metal staining on rocks and veg.			/
	Excessive Temperature Regime			\neg
	Lack of Shading	V		- \
1	Reservoir/Power Plant Discharge	-		
Temperature	Industrial Discharge			0.6
,	Cumulative Watershed NPS	1		
	CDPHE Impairment/TMDL List			∃/
	Unnatural Saturation/Desaturation	\dashv		\dashv
Soil abamiatar	Mechanical Soil Disturbance			
Soil chemistry/	Dumping/introduced Soil			0.75
Redox potential	CDPHE Impairment/TMDL List			

Variable 8: Water and Soil Chemical Environment

Sub-variable Scoring Guidelines

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9 Reference Standard		Stress indicators not present or trivial.
<0.9 - 0.8	Highly Functioning	Stress indicators scarcely present and mild, or otherwise not occurring in more than 10% of the AA.
<0.8 - 0.7 Functioning		Stress indicators present at mild to moderate levels, or otherwise not occurring in more than 33% of the AA.
		Stress indicators present at moderate to high levels, or otherwise not occurring in more than 66% of the AA
<0.6	Non-functioning	Stress indicators strongly evident throughout the AA at levels which apparently alter the fundamental chemical environment of the wetland system

Input each factor score from the stressor list and calculate the sum.



Use the table to score the Chemical Environment Variable circling the applicable scoring rules.

Variable	Condition	Scoring Rules				
Score	Class	Single Factor		Composite Score		
1.0 - 0.9	Reference Standard	No single factor scores < 0.9	or	The factor scores sum > 4.5		
<0.9 - 0.8	Highly Functioning	Any single factor scores ≥ 0.8 but < 0.9	or	The factor scores sum >4.0 but ≤4.5		
<0.8 - 0.7	Functioning	Any single factor scores ≥ 7.0 but < 0.8	or	The factor scores sum >3.5 but ≤ 4.0		
<0.7 - 0.6	Functioning Impaired	Any single factor scores ≥ 0.6 but <0.7	or	The factor scores sum >3.0 but ≤3.5		
< 0.6	Non- functioning	Any single factor scores < 0.6	or	The factor scores sum < 3.0		

Variable 8 Score

Variable 9: Vegetation Structure and Complexity

This variable is a measure of the condition of the wetland's vegetation relative to its native state. It is particularly relevant to the wetland's ability to perform higher-order functions such as support of wildlife populations, eithough it also affects primary functions such as flood-flow attenuation. Score this variable by listing stressors that have affected the diversity, composition and cover of each vegetation cover class that would normally be present for the wetland type being assessed. For this variable, stressor severity is a measure of how much each vegetation stratum differs functionally from its natural condition.

Rules for Scoring:

- 1. Determine the number and types of vegetation layers present within the AA. Make a judgment as to whether additional layers were historically present using direct evidence such as stumps, root wads or historical photographs. Indirect evidence such as local knowledge and expert opinion can also be used in this determination. Check each present or suspected vegetation layer in the third row of the table.
- 2. Do not score vegetation layers that would not normally be present in the wetland type being assessed.
- 3. Estimate the percent coverage of each vegetation layer. Aerial photographs can be helpful for this but are not required. In cases where a stratum has been thinned or removed, enter the expected coverage of that layer **not** the current percent coverage.
- 4. Enter the percent cover values as decimals in the row of the stressor table labeled "Percent Cover of Layer". Note, percentages will often sum to more than 100% (1.0).
- 5. Determine the severity of stressors acting on each individual canopy layers, indicating their presence with checks in the appropriate boxes of the stressor table.
- Determine the sub-variable score for each valid vegetation layer using the scoring guidelines on the second page of the scoring sheet. Enter each sub-variable score in the appropriate cell of the row labeled "Veg. Layer Sub-variable Score".
- 7. Add the "Veg. Layer Sub-variable Scores" and enter the sum in the labeled cell to the right of the individual scores. Follow this same process for the "Percent Cover of Layer".
- 8. Divide the sum of "Veg. Layer Sub-variable Scores" by the total coverage of all layers scored. This product is the Variable 9 score. Enter this number in the labeled box at the bottom of this page.

	,	Vegetatio	n Layers	,	
Layers Scored (check boxes to right to indicate scored layers)	V	·V	V		
Stressor	Tree	Shrub	Herb	Aquatic	Comments
Noxious Weeds			V		
Exotic/Invasive spp.	V		V		CHINESE FLM, REED CANAPUGINASS
Tree Harvest	1/				, ,
Brush Cutting/Shrub Removal	100	V			
Livestock Grazing					
Excessive Herbivory					
Mowing/Haying					
Herbicide					
Loss of Zonation/Homogenization	·V	V			LITTLE RECRUITMENT OCCURRING
Dewatering					
Over Saturation					
Percent Cover of Layer	.30 +	.40 +	.75 +		= 145
Veg. Layer Sub- variable Score	0,6	0, 6	0,75	x 	See sub-variable scoring guidelines on following page
Weighted Sub-variable Score	0.18 +	0,24 +	0,56 +		= 0,98
				1	Variable 9 Score

Sub-variable 9 Scoring Guidelines:
Based on the list of stressors identified above, rate the severity of their cumulative effect on vegetation structure and complexity for each vegetation layer.

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	Reference Standard	Stressors not present or with an intensity low enough as to not detectably affect the structure, diversity or composition of the vegetation layer.
<0.9 - 0.8	Highly Functioning	Stressors present at intensity levels sufficient to cause detectable, but minor, changes in layer composition. Stress related change should generally be less than 10% for any given attribute (e.g., 10% cover of invasive, 10% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as high as 33% for a given attribute if stressors are confined to patches comprising less than 10% of the wetland.
<0.8 - 0.7	Functioning	Stressors present with enough intensity to cause significant changes in the character of vegetation, including alteration of layer coverage, structural complexity and species composition. The vegetation layer retains its essential character though. AA's with a high proportion of non-native grasses will commonly fall in this class. Stress related change should generally be less than 33% for any given attribute (e.g., 33% cover of invasive, 33% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as much as 66% for a given attribute if stressors are confined to patches comprising less than 25% of the wetland.
<0.7 - 0.6	Functioning Impaired	Stressor intensity severe enough to cause profound changes to the fundamental character of the vegetation layer. Stress-related change should generally be less than 66% for any given attribute (e.g., 66% cover of invasive, 66% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as much as 80% of a given attribute if stressors are confined to patches comprising less than 50% of the wetland.
<0.6	Non- functioning	Vegetation layer has been completely removed or altered to the extent that is no longer comparable to the natural structure, diversity and composition.

FACWet Score Card

VARIABLE SCORE TABLE

Scoring Procedure:

- Transcribe variable scores from each variable data sheet to the corresponding cell in the variable score table.
 In each Functional Capacity Index (FCI) equation, enter the corresponding variable scores in the equation cells. Do not enter values in the crossed cells lacking labels.
- 3. Add the variable scores to calculate the total functional points achieved for each function.
- 4. Divide the total functional points achieved by the functional points possible. The typical number of total points possible is provided, however, if a variable is added or subtracted to FCI equation the total possible points must be adjusted
- 5. Calculate the Composite FCI, by adding the FCI scores and dividing by the total number of functions scored (usually 7).
- 6. If scoring is done directly in the Excel spreadsheet, all values will be transferred and calculated automatically.

3/201	DEE COOM				
Buffer & Landscape Context	Variable 1:	Habitat Connectivity - Neighboring Wetland Habitat Loss	0.	65	1
	Variable 2:	Habitat Connectivity - Migration/Dispersal Barriers	0,0		1
La B	Variable 3:	Buffer Capacity	0.		1
ye.	Variable 4:	Water Source	0.6		1
Hydrology	Variable 5:	Water Distribution	0.0	_	1
Ţ	Variable 6:	Water Outflow	0.6		i
D t	Variable 7:	Geomorphology	0,0	-	i
Abiotic and Biotic Habitat	Variable 8:	Chemical Environment		65	i
Abig	Variable 9:	Vegetation Structure and Complexity	0,		
Function	al Capacity	Indices			ц
Eunction 1	Support of Ch	Total			Functional
	+ V2 _{barriers} +	V2 . (0 V0)			Capacity
0.65	+ 0.65 +	0.60 + 1.36 +	- E		Index
		aracteristic Fish/aquatic Habitat			0,652
	+ (2 x V5 _{dist}) +				
1.95	+ 1.3 +	1,3 + 0,65 + 0,69 + = 5,89	÷ 9	=	0,654
Function 3	- Flood Attenua				
V3 _{buffer}	+(2 x V4 _{source} +	(2 x V5 _{dist}) + 2 x V6 _{outflow} + V7 _{geom} + V9 _{veg}			
0.60	+ 1.30 +	1.30 + 1.30 + 0.69 + 0.68 = 5.87	÷ 9	=[0,652
Function 4	Short- and Lo	ng-term Water Storage			
V4 _{source}	+ (2 x V5 _{dist}) + 2				
0.65	1.30 +	1,30 + 0,69 + + = 3.94	÷ 6	= [0.657
	Nutrient/Toxic	ant Removal			
(2 x V5 _{dist}) +	V8 _{chem} +	V7 _{geom}		-	
1,30 +	0.65 +	0.69 + + + = 2.64	÷ 4	=[0.660
		ntion/Shoreline Stabilization			
V3 _{buffer} +	(2 x V7 _{geo}) + (-	
0,60 +	1.38 +	1,36 + + + = 3,34	÷ 5	=	0.668
		port/Food Chain Support			
	2 x V6 _{outflow} +	$V8_{\text{chem}} + V7_{\text{geo}} + (2 \times V9_{\text{veg}})$		F	
0.65 +	1.30 +	0.65 + 0.69 + 1.36 + = 4.65	÷ 7	= [0.664
		Sum of Individual FCI S	cores	. [
		Divide by the Number of Function	ns Sco	red	÷ 7

Composite FCI Score

ADMINISTRATIVE CHARACTERIZATION

General Informati	tion	ROADSIL	E Ditett	Date of Evaluation		3/2/20	17
oonoral mornia	280-5,	281-01 +HAW	LANDS	_ raidalloi			
Site Name or ID:	285-01	WET 201-01 thru thru 06	201 01	Project Name	: 2 -	70 EAST	EIS
404 or Other Permit Application #:				Applicant Name	. C	DOT	
Evaluator Name(s):	R.ME	LDOUNIEY	Evaluator's profe	essional position an organization	d 1	than11) SC HICINIS	HENHIST
Location Informa	tion:						
Site Location (Lat./Long. or UTM):		ROADSIDE C		Geographic Datum Used			
		,	7 0				
USGS Quadrangle Map:	MONT	BELLO		Map Scale: (Circle one)		1:24,000 Other	1:100,000 1:
Sub basin Name (8 digit HUC):	10190003	- MIDDLES - CHER	OUTH PLATT	Wetland Ownership:	CDO		.,
Project Information	on:	THE SERVICE	Purpose of	Potentially Im	. Walter Company		
This evaluation is being performed at: (Check applicable box)	∑ Project We Mitigation		Evaluation (check all applicable):	Mitigation; Po Monitoring Other (Descri	st-cons		
ntent of Project: (Chec	k all applicable		Restortation	☐ En	hanceme	ent [Creation
Total Size of Wetland Record Area, Check and De Measurement Method Used)	escribe	ac.	Measured (G195/G15			
Assessment Area (AA) Size (Record trea, check appropriate box. Additional spaces re used to record acreage when more than one A is included in a single assessment)		ac. ×	Measured	ac.	ac.	ac.	ac.
		100000	Estimated	ac.	ac.	ac.	ac.
characteristics or Meth A boundary determina	Mary Mary Company of the Company of	WETCHAID ARE INCCU IN ROADSIDE	DED IN MY	TO RECARK	E THE	1 red are	
Notes: Sites	ANE "NOV	EL" WETHER	NIDS THAT	HAVE SOON!			

ECOLOGICAL DESCRIPTION 1 Special Concerns Check all that apply Organic soils including Histosols or Histic Epipedons are Federally threatened or endangered species are present in the AA (i.e., AA includes core fen habitat). SUSPECTED to occur in the AA? Project will directly impact organic soil portions of the AA including areas possessing either Histosol soils or histic Organic soils are known to occur anywhere within the Species of concern according to the Colorado Natural Heritage (CNHP) are known to occur in the AA? contiguous wetland of which the AA is part. The wetland is a habitat oasis in an otherwise dry or The site is located within a potential conservation area or element occurrence buffer area as urbanized landscape? determined by CNHP? Other special concerns (please describe) Federally threatened or endangered species are KNOWN to occur in the AA? List Below. HYDROGEOMORPHIC SETTING AA wetland maintains its fundamental natural hydrogeomorphic characteristics AA wetland has been subject to change in HGM classes as a result of anthropogenic modification If the above is checked, please describe the original wetland type if discernable using the table below. AA wetland was created from an upland setting. Describe the hydrogeomorphic setting of the wetland by circling all conditions Current Conditions that apply. Surface flow (Groundwater) Water source Precipitation Unknown Hydrodynamics Unidirectional Vertical Bi-directional 0-2% Wetland Gradient 2-4% 4-10% >10% 1 # Surface Inlets Over-bank >3 # Surface Outlets >3 **HGM Setting** Geomorphic ROADSIDE DITCHES Setting (Narrative Description. Include approx. stream order for riverine) **HGM class** Slope Depressional Riverine Lacustrine **Historical Conditions** Surface flow Groundwater Precipitation Unknown Water source Hydrodynamics Unidirectional Vertical Previous Geomorphic wetland typology Setting (Narrative Previous HGM Depressional Riverine Slope Lacustrine Class

Notes (include information on the AA's HGM subclass and regional subclass):

THESE ROADSIDE DITCH WETCAMDS AME "NOVEL" AND HAVE NO GOOD NATURAL ANALOG.

ECOLOGICAL DESCRIPTION 2

System	Subsystem	Class	Subclass	Water Regime	Other Modifiers	% AA
PALMSTRINE	Palusmina	E EM	PERSISTENT	A.B.E	×	80
25.00	PALUSTRINA	25-217	BLARCIDHOUS	A; B, E	×	20
Lacustrine	Littoral; Limnoral			Examples	Hypersaline(7); Eusaline(8);	
Palustrine	Palustrine	Rock Bot. (RB) Uncon Bottom(UB)	Floating vascular, Rooted vascular;	Temporarily flooded(A); Saturated(B);	Mixosaline(9); Fresh(0); Acid(a);	
Riverine	Lower perennial; Upper perennial; Intermittent	Aquatic Bed(AB) Rocky Shore(RS) Uncon Shore(US) Emergent(EM) Shrub-scrub(SS) Forested (FO)	Algal: Persistent; Non-Persistent; Broad-leaved deciduous; Needle-leaved evergreen; Cobble - gravel; Sand; Mud; Organic	Seasonally flooded(C); Seasflood./sat.(E); Semi-Perm. flooded(F); Intermittently exposed(G); Artificially flooded(K); Sat./semiperm./Seas. (Y); Int. exposed/permenant(Z)	Circumneural(c); Alkaline/calcareous(i); Organic(g); Mineral(n); Beaver(b); Partially Drained/ditched(d); Farmed(f); Diked/impounded(h); Artificial Substrate(r); Spoil(s); Excavated(x)	

Site Map Scale: 1 sq. =	Draw a sketch map of the site including relevant portions of the wetland, AA boundary, structures, habitat classes, and other significant features. SEE AERIAL MAD.					
		T				
		+				
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Variable 1: Habitat Connectivity - Neighboring Wetland Habitat Loss

This variable is a measure of how isolated from other naturally-occurring wetland or riparian habitat the AA has become as a result of the loss of that habitat. To score this variable, estimate the percent of naturally-occurring wetland/riparian habitat that has been lost (by filling, draining, development, or whatever means) within a 500-meter-wide belt surrounding the AA. This surrounding area is called the Habitat Connectivity Envelope (HCE). Historical photographs and NWI and hydric soils maps can be helpful in scoring this variable. In most cases the evaluator must use best professional judgment in estimating the amount of natural wetland loss. Evaluation of landforms and habitat patterns in the context of perceivable land use change should be used to steer estimates of the amount of wetland loss within the HCE. This variable is not meant to penalize AAs that are naturally isolated, or unique to the landscape. Rather, it should measure the degree to which natural habitat connectivity has been lost.

Rules for Scoring:

- 1. On the aerial photo, create a 500 meter perimeter around the AA.
- 2. The area within this perimeter is the Habitat Connectivity Envelope (HCE).
- Within the HCE, outline the current extent of naturally occurring wetland and riparian habitat. Do not include habitats such as excavated ponds or reservoir induced fringe wetlands.
- 4. Outline the historical extent of wetland and riparian habitats (i.e., existing natural wetlands plus those that have been destroyed).
- Use your knowledge of the history of the area and evident land use change to identify where habitat losses have occurred. Additional research could be utilized to increase the accuracy of this estimate including consideration of floodplain maps, historical aerial photographs, etc.
- Calculate the area of existing and historical wetlands. Divide the area values to determine the percentage of naturally occurring wetland habitat that remains in the HCE, and determine the variable score using the guidelines below.

Variable Score	Condition Category	Scoring Guidelines
1.0 - 0.9	Reference Standard	Wetland losses are absent or negligible or there is no evidence to suggest the native landscape within the HCE historically contained other wetland habitats
<0.9 - 0.8	Highly Functioning	More than 80% of historical wetland habitat area within the HCE is still present (less than 20% of habitat area lost).
<0.8 - 0.7	Functioning	80 to 60% of historical wetland habitat area within the HCE is still present (20% to 40% of habitat area lost).
<0.7 - 0.6	Functioning Impaired	Less than 60 to 25% of historical wetland habitat area within the HCE is still present (more than 40 to 75% of habitat area lost).
<0.6	Non- functioning	Less than 25% of the historical wetland habitat area within the HCE still in existence (more than 70% of habitat lost).

Notes: It appears likely that MATURALLY OCCURRIAGE WESLAMOS WERE
RELATIVELY SCARCE IN 17this AREA Historically.

Variable 2: Habitat Connectivity - Migration/Dispersal Barriers

This variable is intended to rate the degree to which the AA has become isolated from existing neighboring wetland and riparian habitat by artificial barriers that inhibit migration or dispersal of organisms. On the aerial photograph, identify the man-made barriers within the HCE that intercede between the AA and surrounding wetlands and riparian areas, and identify them by type on the stressor list. Score this variable based on the barriers' impermeability to migration and dispersal and the amount of surrounding wetland/riparian habitat they affect.

Rules for Scoring:

- 1. On the aerial photo, outline all existing wetland and riparian habitat areas within the HCE. This includes naturally occurring habitats as well as those purposefully created or induced by land use change.
- 2. Identify artificial barriers to dispersal and migration of organisms within the HCE that intercede between the AA and surrounding habitats. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.
- 3. Considering the composite effect of all of identified barriers to migration and dispersal (i.e., stressors), assign an overall variable score using the scoring guidelines.

V	/	Stressors	Comments/description
	7	Major Highway	I-70
	/	Secondary Highway	Side streets
		Tertiary Roadway	
		Railroad	
		Bike Path	
1	/	Urban Development	HOUSES PANGING LOTS, INDUSTRIAL/COMMERCIAL
\Box		Agricultural Development	
		Artificial Water Body	
		Fence	
		Ditch or Aqueduct	
E		Aquatic Organism Barriers	
		- U.T.	

Variable Score	Condition Class	Scoring Guidelines No appreciable barriers exist between the AA and other wetland and riparian habitats in the HCE; or there are no other wetland and riparian areas in the HCE.	
1.0 - 0.9	Reference Standard		
<0.9 - 0.8	Highly Functioning	Barriers impeding migration/dispersal between the AA and up to 33% of surrounding wetland/riparian habitat highly permeable and easily passed by most organisms. Examples could include gravel roads, minor levees, ditches or barbed-wire fences. Mon significant barriers (see "functioning category below) could affect migration to up to 10% of surrounding wetland/riparian habitat.	
<0.8 - 0.7	Functioning	Barriers to migration and dispersal retard the ability of many organisms/propagules to pass between the AA and up to 66% of wetland/riparian habitat. Passage of organisms and propagules through such barriers is still possible, but it may be constrained to certain times of day, be slow, dangerous or require additional travel. Busy two-lane roads, culverted areas, small to medium artificial water bodies or small earthen dams would commonly rate a score in this range. More significant barriers (see "functioning impaired category below) could affect migration to up to 10% of surrounding wetland/riparian habitat.	
<0.7 - 0.6	Functioning Impaired	Barriers to migration and dispersal preclude the passage of some types of organisms/propagules between the AA and up to 66% of surrounding wetland/riparian habitat. Travel of those animals which can potential negotiate the barrier are strongly restricted and may include a high chance of mortality. Up to 33% of surrounding wetland/riparian habitat could be functionally isolated from the AA.	
<0.6	Non-functioning	AA is essentially isolated from surrounding wetland/riparian habitat by impermeable migration and dispersal barriers. An interstate highway or concrete-lined water conveyance canal are examples of barriers which would generally create functional isolation between the AA and wetland/riparian habitat in the HCE.	

URBAN SETTING

Variable 2 Score | 0.65

Variable 3: Buffer Capacity

The buffer area is defined as a 250-meter-wide belt surrounding the perimeter of the AA. This variable is a measure of the capacity of that area to function as an effective buffer for the wetland against the deleterious effects of surrounding land use change. To score the variable, assume that the AA is 100% buffered except where land use changes inside the buffer area have diminished this quality. Identify these land use types as specific stressors in the list. For each stressor, rate severity and extent within the buffer area; then use this list to make an overall rating for the buffer's departure from reference conditions. When rating buffer capacity, consider both the intensity of the impact and the proximity of the stressor to the AA.

Rules for Scoring:

- 1. On the aerial photograph, delimit the buffer area (BA) as the zone within 250 meters of the outer boundary of the
- 2. Use the stressor list to record land use changes that affect buffering capacity within the buffer area. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.
- Considering all of the identified stressors, their composite severity, extent and proximity to the AA assign an overall variable score using the scoring guidelines.

TV	Stressors	Comments/description
1	Industrial/commercial	
- All and a second a second and	Urban	
" L	/ Residential	
	Rural	
	Dryland Farming	
	Intensive Agriculture	
	Orchards or Nurseries	
-	Livestock Grazing	
	Transportation Corridor	
	Urban Parklands	
	Dams/impoundments	
	Artificial Water body	
	Physical Resource Extraction	
	Biological Resource Extraction	

Variable Score	Condition Class	Scoring Guidelines	
1.0 - 0.9	Reference Standard	No appreciable land use change has been imposed within the TBA and it provides the fu buffering capacity.	
<0.9 - 0.8	Highly Functioning	Some land use change has occurred in the BA, but such changes little impair the area's ability to provide a buffering function, either because land use is not intensive, for examp haying, light grazing, or low intensity silviculture, or more substantial changes occur in approximately less than 10% of the BA.	
<0.8 - 0.7	Functioning	BA has been subjected to a marked shift in land use, however, the land retains much of its original buffering capacity. Moderate-intensity land uses such as dry-land farming, urban "green" corridors, or moderate cattle grazing would commonly be placed within this scoring range.	
<0.7 - 0.6	Functioning Impaired	Land use changes within the BA has been substantial including the a moderate to high coverage (up to 50%) of impermeable surfaces, bare soil, or other artificial surface; considerable in-flow urban runoff or fertilizer-rich waters common. While, the buffering capacity of the land has been greatly diminished it is not extinguished. Intensively logged areas, low-density urban developments, some urban parklands and some cropping situations would commonly rate a score within this range.	
<0.6	Non-functioning	The area within the BA provides essentially no buffering capacity. Many Commercial developments or highly urban landscapes would rate a score of less than 0.6.	

<0.6	Non-functioning	The area within the BA provides essentially no buffering capacity. Many Comm developments or highly urban landscapes would rate a score of less than 0.6.
BUFFERS URBANILO	Exist But ARE	Minimal B/c of Remosize/ Variable 3 score

Variable 4: Water Source

This variable is concerned with up-gradient hydrologic connectivity. It is a measure of the impacts to the AA's water source, including the ability of source water to perform work such as sediment transport, erosion, soil pore flushing, etc. To score this variable, identify stressors that alter the source of water to the AA, and record their presence on the stressor list. Stressors can impact water source by depletion, augmentation, or alteration of inflow timing or hydrodynamics. For riverine systems, this variable is primarily concerned with the connection of the channel to the floodplain. This variable is designed to assess water quantity, power and timing, not water quality. Water quality will be evaluated in Variable 8.

- 1. Use the stressor list and knowledge of the watershed to catalog type-specific impairments of the AA's water source. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.
- 2. Considering the composite effect of stressors on the water source, rate the condition of this variable with the aid of the scoring guidelines.

V	Stressors	Comments/description	
V	Ditches or Drains (tile, etc.)		
	Dams		
	Diversions		
	Groundwater pumping	A CONTRACTOR OF THE CONTRACTOR	
	Draw-downs		
-	Culverts or Constrictions		
	Point Source (urban, ind., ag.)		
V	Non-point Source		
12	Increased Drainage Area		
V	Storm Drain/Urban Runoff		
V	Impermeable Surface Runoff		
	Irrigation Return Flows		
	Mining/Natural Gas Extraction		
	Transbasin Diversion		
1	Actively Managed Hydrology		

Variable Score	Condition Class	Depletion	Augmentation
1.0 - 0.9	Reference Standard	Unnatural drawdown events minor, rare or non- existent, very slight uniform depletion, or trivial alteration of hydrodynamics.	Unnatural high-water events minor, rare or non- existent, slight uniform increase in amount of inflow, or trivial alteration of hydrodynamics.
<0.9 - 0.8	Highly Functioning	Unnatural drawdown events occasional, short duration and/or mild; or uniform depletion up to 20%; or mild to moderate reduction of peak flows or capacity of water to perform work.	Occasional unnatural high-water events, short in duration and/or mild in intensity; or uniform augmentation up to 20%; or mild to moderate increase of peak flows or capacity of water to perform work.
<0.8 - 0.7	Functioning	Unnatural drawdown events common and of mild to moderate intensity and/or duration; or uniform depletion up to 50%; or moderate to substantial reduction of peak flows or capacity of water to perform work.	Common occurrence of unnatural high-water events, of a mild to moderate intensity and/or duration; or uniform augmentation up to 50%; or moderate to substantial increase of peak flows or capacity of water to perform work.
<0.7 - 0.6	Functioning Impaired	Unnatural drawdown events occur frequently with a moderate to high intensity and/or duration; or uniform depletion up to 75%; or substantial reduction of peak flows or capacity of water to perform work. Wetlands with actively managed or wholly artificial hydrology will usually score in this range or lower.	Common occurrence of unnatural high-water events, some of which may be severe in nature or exist for a substantial portion of the growing season; or uniform augmentation more than 50% or capacity of water to perform work. Wetlands with actively managed or wholly artificial hydrology will usually score in this range or lower.
<0.6	Non- functioning	Water source diminished enough to threaten or extinguish wetland hydrology in the AA.	Frequency, duration or magnitude of unnaturally high- water great enough to change the fundamental characteristics of the wetland.

URBANI SETTINGS ADJACENT TO A MAJOR TRANSMORTATION CORRIDOR.

Variable 4 Score 0,6

Variable 5: Water Distribution

This variable is concerned with hydrologic connectivity within the AA. It is a measure of alteration to the spatial distribution of surface and groundwater within the AA. These alterations are manifested as local changes to the hydrograph and generally result from geomorphic modifications. To score this variable, identify stressors that alter flow patterns and impact the hydrograph within the AA, including localized increases or decreases to the depth or duration of the water table or surface water. In most cases, the Water Source variable score will determine the maximum achievable score for Water Distribution, since the condition of the water source exerts a primary control on the wetland's capacity to distribute water in a characteristic fashion and exhibit a natural hydrograph.

Scoring rules:

- 1. Identify impacts to the natural distribution of water throughout the AA and catalog them in the stressor table.
- Considering all of the stressors identified, assign an overall variable score using the scoring guidelines. In most cases, the Water Source variable score will set the upper limit for the Water Distribution score.

\checkmark	Stressors	Comments/description
	Alteration of Water Source	
	Ditches	Note that the second se
	Ponding/Impoundment	
	Culverts	
	Road Grades	
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Enlarged Channel	
	Artificial Banks/Shoreline	A-11/2001
	Weirs	
	Dikes/Levees/Berms	
	Diversions	
	Sediment/Fill Accumulation	

Variable Score	Condition Class	Non-riverine	Riverine
1.0 - 0.9	Reference Standard	Little or no alteration has been made to the way in which water is distributed throughout the wetland. AA maintains a natural hydrologic regime.	Natural active floodplain areas flood on a normal recurrence interval. No evidence of alteration of flooding and subirrigation duration and intensity.
<0.9 - 0.8	Highly Functioning	Less than 10% of the AA is affected by in situ hydrologic alteration; or more widespread impacts result in less than a 2 in. (5 cm) change in mean growing season water table elevation.	Channel-adjacent areas have occasional unnatural periods of drying or flooding; or uniform shift in the hydrograph less than typical root depth.
<0.8 - 0.7	Functioning	Between 10 and 33% of the AA is affected by in situ hydrologic alteration; or more widespread impacts result in a 4 in. (5 cm) or less change in mean growing season water table elevation.	In channel-adjacent area, periods of drying or flooding are common; or uniform shift in the hydrograph near root depth.
<0.7 - 0.6	Functioning Impaired	33 to 66% of the AA is affected by in situ hydrologic alteration; or more widespread impacts result in a 6 in. (15 cm) or less change in mean growing season water table elevation. Water table behavior must still meet jurisdictional criteria to merit this rating.	Adjacent to the channel, unnatural periods of drying or flooding are the norm; or uniform shift in the hydrograph greater than root depth.
<0.6		More than 66% of the AA is affected by hydrologic alteration which changes the fundamental functioning of the wetland system, generally exhibited as a conversion to upland or deep water habitat.	Historical active floodplain areas are almost never wetted from overbank flooding, and/or groundwater infiltration is effectively cut off.

WATER SOURCE IS MAIN FACTOR.

Variable 5 Score

0.6

Variable 6: Water Outflow

This variable is concerned with down-gradient hydrologic connectivity and the flow of water (transporting materials and energy) out of the AA. It is a measure of impacts that affect the hydrologic outflow of water including the passage of water through its normal low- and high-flow surface outlets, and infiltration/groundwater recharge. In some cases, alteration of evapotranspiration rates may be significant enough of a factor to consider in scoring. Score this variable by identifying stressors that impact the means by which water is exported from the AA. In Variable 5, the stressors were evaluated in light of their impact on water distribution within the AA. To evaluate this variable focus on the AA's ability to export water, energy and associated materials to habitats down-gradient of the AA. In most cases, the Water Source variable score will determine the maximum achievable score for Water Outflow, since the condition of the water source exerts a primary control over the wetland's capacity to export water and associated materials.

Scoring rules:

- 1. Identify impacts to the natural outflow of water from the AA and catalog them in the stressor table.
- 2.Considering all of the stressors identified, assign an overall variable score using the scoring guidelines. Take in to account the cumulative effect of stressors on the wetland's ability to export water and water-borne materials. In most cases the Water Source variable will set the upper limit for the Water Outflow score.

1	Stressors	Comments/description
	Alteration of Water Source	
V	Ditches	
	Dikes/Levees	
V	Road Grades	
V	Culverts	
	Diversions	
	Constrictions	
	Channel Incision/Entrenchment	
V	Hardened/Engineered Channel	
	Artificial Stream Banks	
	Weirs	
	Confined Bridge Openings	

Variable Score	Condition Class	Scoring Guidelines Stressors have little to no effect on the magnitude, timing or hydrodynamics of the AA water outflow regime. High- or low-water outflows are mildly to moderately affected, but at intermediate ("normal") levels flow continues essentially unaltered in quantity or character.					
1.0 - 0.9	Reference Standard						
<0.9 - 0.8	Highly Functioning						
<0.8 - 0.7 Functioning		High- or low-water outflows are moderately affected, mild alteration of intermediate leve outflow occurs; or hydrodynamics moderately affected.					
<0.7 - 0.6	Functioning Impaired	Outflow at all stages is moderately to highly impaired resulting in persistent flooding of portions of the AA or unnatural drainage; or outflow hydrodynamics severely disrupted.					
<0.6	Non-functioning	The natural outflow regime is profoundly impaired. Down-gradient hydrologic connection severed or nearly so. Alterations may cause widespread unnatural persistent flooding or dewatering of the wetland system.					

Variable 6 Score

0,6

Variable 7: Geomorphology

This variable is a measure of the degree to which the geomorphic setting has been altered within the AA. Changes to the surface configuration and natural topography constitute stressors. Such stressors may be observed in the form of fill, excavation, diking, sedimentation due to absence of flushing floods, etc. In riverine systems geomorphic changes to stream channel should be considered if the channel is within the AA. Alterations may include bed surface changes (embeddedness or morphology changes), stream bank instability, and stream channel reconfiguration. Geomorphic changes are usually ultimately manifested as changes to wetland hydrology and water relations with vegetation. Geomorphic alteration can also directly affect soil properties, such as near-surface texture, and the wetland chemical environment, such as the redox state or nutrient composition in the rooting zone. In rating this variable, do not include the resultant effects of geomorphic change; rather focus on the physical impacts within the footprint of the alteration. The effects of geomorphic change are addressed by other variables. All alterations to geomorphology should be evaluated including small-scale impacts such as pugging, hoof sheer, and sedimentation which constitute important, but not immediately apparent, impacts.

Scoring Rules

- 1. Identify impacts to geomorphological setting and topography within the AA and record them on the stressor checklist.
- 2. Considering all of the stressors identified, assign an overall variable score using the scoring guidelines.

/	1	Stressors	Comments
	Г	Dredging/Excavation/Mining	
V	1	Fill, including dikes, road grades, etc	
V	1	Grading	
	- l	Compaction	
	eral	Plowing/Disking	
	1 5	Excessive Sedimentation	
	٥	Dumping	
	1	Hoof Shear/Pugging	
	1	Aggregate or Mineral Mining	
V		Sand Accumulation	ROAD SAND CAN DOTENTIALLY ACCUMULATE
		Channel Instability/Over Widening	7
	슬	Excessive Bank Erosion	
\Box	ō	Channelization	
\Box	5	Reconfigured Stream Channels	
	ne	Artificial Banks/Shoreline	
	Channels	Beaver Dam Removal	
	Ch	Substrate Embeddedness	
	108	Lack or Excess of Woody Debris	
\Box			

Variable Score	Condition Class	Scoring Guidelines					
1.0 - 0.9	Reference Standard	Topography essentially unaltered from the natural state, or alterations appear to have a minimal effect or wetland functioning and condition. Patch or microtopographic complexity may be slightly altered, but native plant communities are still supported.					
<0.9 - 0.8	Highly Functioning	Alterations to topography result in small but detectable changes to habitat conditions in some or all of the AA; or more severe impacts exist but affect less than 10% of the AA.					
<0.8 - 0.7	Functioning	Changes to AA topography may be pervasive but generally mild to moderate in severity. May include patches of more significant habitat alteration; or more severe alterations affect up to 20 % of the AA.					
<0.7 - 0.6	Functioning Impaired	At least one important surface type or landform has been eliminated or created; microtopography has been strongly impacted throughout most or all of the AA; or more severe alterations affect up to 50% of the AA. Evidence that widespread diminishment or alteration of native plant community exist due to physical habitat alterations. Most incidentally created wetland habitat such as that created by roadside ditches and the like would score in this range or lower.					
<0.6	Non- functionina	Pervasive geomorphic alterations have caused a fundamental change in site character and functioning, commonly resulting in a conversion to upland or deepwater habitat.					

Variable 7 Score

0.6

Variable 8: Water and Soil Chemical Environment

This variable concerns the chemical environment of the soil and water media within the AA, including pollutants and water quality. The origin of pollutants may be in the AA or delivered from up-gradient or surrounding areas. Score this variable by listing indicators of chemical stress in the AA. Consider point source and non-point sources of pollution, as well as mechanical or hydrologic changes that alter the chemical environment. Because water quality frequently cannot be inferred directly, the presence of many stressors is identified via indirect indicators.

Scoring rules:

- 1. Stressors are grouped into categories which have a similar signature or set of causes.
- 2. Use the indicator list to identify each stressor impacting the chemical environment of the AA.
- 3. For each stressor category, determine the sub-variable score using the scoring guideline table provided on the second page of the scoring sheet.
- -If the AA is part of a water body that is recognized as impaired or recommended for TMDL development for one of the factors, then score that sub-variable 0.65 or lower.
- 4. Transcribe sub-variable scores to the following variable scoring page and compute the sum.
- 5. Determine the variable score by following the scoring guidelines.

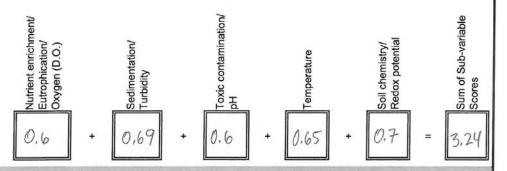
Stressor Indicator		Comments	Sub-
Livestock			variable
Agricultural Runoff			Score
Septic/Sewage			0/
Excessive Algae or Aquatic Veg.			0.6
Cumulative Watershed NPS	V		7/
CDPHE Impairment/TMDL List			\exists \prime
Excessive Erosion			- (
Excessive Deposition			\neg \
Fine Sediment Plumes			
Agricultural Runoff			0.10
Excessive Turbidity			- 0.69
Nearby Construction Site			
Cumulative Watershed NPS	V		\neg /
CDPHE Impairment/TMDL List			□/
Recent Chemical Spills	V		- (
Nearby Industrial Sites	V		 \
			\dashv \
Livestock			
Agricultural Runoff			\dashv \
Storm Water Runoff			
Fish/Wildlife Impacts			0,6
Vegetation Impacts			\dashv \vdash
Cumulative Watershed NPS	V		\dashv /
Acid Mine Drainage			\dashv /
3			\dashv /
			⊣ /
			 /
	/		_
Lack of Shading			\dashv \
	F122.0724		0.65
	7		\neg
CDPHE Impairment/TMDL List			\exists /
Unnatural Saturation/Desaturation			- K
Mechanical Soil Disturbance	V		
Dumping/introduced Soil			0.7
CDPHE Impairment/TMDL List			
	Livestock Agricultural Runoff Septic/Sewage Excessive Algae or Aquatic Veg. Cumulative Watershed NPS CDPHE Impairment/TMDL List Excessive Erosion Excessive Deposition Fine Sediment Plumes Agricultural Runoff Excessive Turbidity Nearby Construction Site Cumulative Watershed NPS CDPHE Impairment/TMDL List Recent Chemical Spills Nearby Industrial Sites Road Drainage/Runoff Livestock Agricultural Runoff Storm Water Runoff Fish/Wildlife Impacts Vegetation Impacts Cumulative Watershed NPS Acid Mine Drainage Point Source Discharge CDPHE Impairment/TMDL List Metal staining on rocks and veg. Excessive Temperature Regime Lack of Shading Reservoir/Power Plant Discharge Industrial Discharge Cumulative Watershed NPS CUMULative Watershed NPS COPHE Impairment/TMDL List Metal staining on rocks and veg. Excessive Temperature Regime Lack of Shading Reservoir/Power Plant Discharge Industrial Discharge CUMULative Watershed NPS COPHE Impairment/TMDL List Unnatural Saturation/Desaturation Mechanical Soil Disturbance Dumping/introduced Soil	Livestock Agricultural Runoff Septic/Sewage Excessive Algae or Aquatic Veg. Cumulative Watershed NPS CDPHE Impairment/TMDL List Excessive Erosion Excessive Deposition Fine Sediment Plumes Agricultural Runoff Excessive Turbidity Nearby Construction Site Cumulative Watershed NPS CDPHE Impairment/TMDL List Recent Chemical Spills Nearby Industrial Sites Road Drainage/Runoff Livestock Agricultural Runoff Storm Water Runoff Fish/Wildlife Impacts Vegetation Impacts Cumulative Watershed NPS Acid Mine Drainage Point Source Discharge CDPHE Impairment/TMDL List Metal staining on rocks and veg. Excessive Temperature Regime Lack of Shading Reservoir/Power Plant Discharge Cumulative Watershed NPS CDPHE Impairment/TMDL List Unnatural Saturation/Desaturation Mechanical Soil Disturbance Dumping/introduced Soil	Livestock Agricultural Runoff Septic/Sewage Excessive Algae or Aquatic Veg. Cumulative Watershed NPS CDPHE Impairment/TMDL List Excessive Erosion Excessive Deposition Fine Sediment Plumes Agricultural Runoff Excessive Turbidity Nearby Construction Site Cumulative Watershed NPS CDPHE Impairment/TMDL List Recent Chemical Spills Nearby Industrial Sites Road Drainage/Runoff Livestock Agricultural Runoff Storm Water Runoff Fish/Wildlife Impacts Vegetation Impacts Cumulative Watershed NPS Acid Mine Drainage Point Source Discharge CDPHE Impairment/TMDL List Metal staining on rocks and veg. Excessive Temperature Regime Lack of Shading Reservoir/Power Plant Discharge Industrial Discharge Cumulative Watershed NPS CDPHE Impairment/TMDL List Unnatural Saturation/Desaturation Mechanical Soil Disturbance Dumping/introduced Soil

Variable 8: Water and Soil Chemical Environment

Sub-variable Scoring Guidelines

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	Reference Standard	Stress indicators not present or trivial.
<0.9 - 0.8	Highly Functioning	Stress indicators scarcely present and mild, or otherwise not occurring in more than 10% of the AA.
<0.8 - 0.7	Functioning	Stress indicators present at mild to moderate levels, or otherwise not occurring in more than 33% of the AA.
<0.7 - 0.6	Functioning Impaired	Stress indicators present at moderate to high levels, or otherwise not occurring in more than 66% of the AA
<0.6	Non-functioning	Stress indicators strongly evident throughout the AA at levels which apparently alter the fundamental chemical environment of the wetland system

Input each factor score from the stressor list and calculate the sum.



Use the table to score the Chemical Environment Variable circling the applicable scoring rules.

Variable	Condition	Scoring Rules						
Score	Class	Single Factor		Composite Score				
1.0 - 0.9	Reference Standard	No single factor scores < 0.9	or	The factor scores sum > 4.5				
<0.9 - 0.8 Highly Functioning		Any single factor scores ≥ 0.8 but < 0.9	or	The factor scores sum >4.0 but ≤4.5				
<0.8 - 0.7	Functioning	Any single factor scores ≥ 7.0 but < 0.8	or	The factor scores sum >3.5 but ≤ 4.0				
<0.7 - 0.6	Functioning Impaired	Any single factor scores ≥ 0.6 but <0.7	or	The factor scores sum >3.0 but ≤3.5				
< 0.6	Non- functioning	Any single factor scores < 0.6	or	The factor scores sum < 3.0				

Variable 8 Score

0,65

Variable 9: Vegetation Structure and Complexity

This variable is a measure of the condition of the wetland's vegetation relative to its native state. It is perticularly relevant to the wetland's ability to perform higher-order functions such as support of wildlife populations, although it also affects primary functions such as flood-flow attenuation. Score this variable by listing stressors that have affected the diversity, composition and cover of each vegetation cover class that would normally be present for the wetland type being assessed. For this variable, stressor severity is a measure of how much each vegetation stratum differs functionally from its natural condition.

Rules for Scoring:

- 1. Determine the number and types of vegetation layers present within the AA. Make a judgment as to whether additional layers were historically present using direct evidence such as stumps, root wads or historical photographs. Indirect evidence such as local knowledge and expert opinion can also be used in this determination. Check each present or suspected vegetation layer in the third row of the table.
- 2. Do not score vegetation layers that would not normally be present in the wetland type being assessed.
- 3. Estimate the percent coverage of each vegetation layer. Aerial photographs can be helpful for this but are not required. In cases where a stratum has been thinned or removed, enter the expected coverage of that layer **not** the current percent coverage.
- 4. Enter the percent cover values as decimals in the row of the stressor table labeled "Percent Cover of Layer". Note, percentages will often sum to more than 100% (1.0).
- 5. Determine the severity of stressors acting on each individual canopy layers, indicating their presence with checks in the appropriate boxes of the stressor table.
- Determine the sub-variable score for each valid vegetation layer using the scoring guidelines on the second page of the scoring sheet. Enter each sub-variable score in the appropriate cell of the row labeled "Veg. Layer Sub-variable Score".
- 7. Add the "Veg. Layer Sub-variable Scores" and enter the sum in the labeled cell to the right of the individual scores. Follow this same process for the "Percent Cover of Layer".
- 8. Divide the sum of "Veg. Layer Sub-variable Scores" by the total coverage of all layers scored. This product is the Variable 9 score. Enter this number in the labeled box at the bottom of this page.

	Vegetation Layers				
Layers Scored (check boxes to right to indicate scored layers)		V	/		
Stressor	Tree	Shrub	Herb	Aquatic	Comments
Noxious Weeds			V		
Exotic/Invasive spp.			V		
Tree Harvest					
Brush Cutting/Shrub Removal		V			
Livestock Grazing					
Excessive Herbivory					
Mowing/Haying			V.		ROW MAINTENANCE
Herbicide			1/		Noxious WEED SPRAYING
Loss of Zonation/Homogenization			1/		1307,3007, 2032, 7
Dewatering		V	/		CHANGES IN Flow ROUTING
Over Saturation			V		CHANGES IN Plan ROLLING
Percent Cover of Layer	+ x	20 +	80 +	×	= 100
Veg. Layer Sub- variable Score		0,65	0.65		See sub-variable scoring guidelines on following page
Weighted Sub-variable Score	+	13 +	52 +		= (05
					Variable 9 Score

Sub-variable 9 Scoring Guidelines:
Based on the list of stressors identified above, rate the severity of their cumulative effect on vegetation structure and complexity for each vegetation layer.

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	Reference Standard	Stressors not present or with an intensity low enough as to not detectably affect the structure, diversity or composition of the vegetation layer.
<0.9 - 0.8	Highly Functioning	Stressors present at intensity levels sufficient to cause detectable, but minor, changes in layer composition. Stress related change should generally be less than 10% for any given attribute (e.g., 10% cover of invasive, 10% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as high as 33% for a given attribute if stressors are confined to patches comprising less than 10% of the wetland.
<0.8 - 0.7	Functioning	Stressors present with enough intensity to cause significant changes in the character of vegetation, including alteration of layer coverage, structural complexity and species composition. The vegetatic layer retains its essential character though. AA's with a high proportion of non-native grasses will commonly fall in this class. Stress related change should generally be less than 33% for any given attribute (e.g., 33% cover of invasive, 33% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as much as 66% for a given attribute if stressors are confined to patches comprising less than 25% of the wetland.
<0.7 - 0.6	Functioning Impaired	Stressor intensity severe enough to cause profound changes to the fundamental character of the vegetation layer. Stress-related change should generally be less than 66% for any given attribute (e.g., 66% cover of invasive, 66% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as much as 80% of a given attribute if stressors are confined to patches comprising less than 50% of the wetland.
<0.6	Non- functionina	Vegetation layer has been completely removed or altered to the extent that is no longer comparable to the natural structure, diversity and composition.

FACWet Score Card

VARIABLE SCORE TABLE

Scoring Procedure:

- 1. Transcribe variable scores from each variable data sheet to the corresponding cell in the variable score table.
- 2. In each Functional Capacity Index (FCI) equation, enter the corresponding variable scores in the equation cells. Do not enter values in the crossed cells lacking labels.
- 3. Add the variable scores to calculate the total functional points achieved for each function.
- 4. Divide the total functional points achieved by the functional points possible. The typical number of total points possible is provided, however, if a variable is added or subtracted to FCI equation the total possible points must be adjusted
- 5. Calculate the Composite FCI, by adding the FCI scores and dividing by the total number of functions scored (usually 7).
- 6. If scoring is done directly in the Excel spreadsheet, all values will be transferred and calculated automatically.

Variable 1: Habitat Connectivity - Neighboring Wetland Habitat Loss

1	uffer	Variable 2:	Habitat Connectivity - Migration/Dispersal Barriers	0.65	
L	Buffe Landsc Conte	Variable 3:	Buffer Capacity	0.60	
Γ	660	Variable 4:	Water Source	0.60	
1	Hydrology	Variable 5:	Water Distribution	0,60	
L	Ť	Variable 6:	Water Outflow	0.60	
Γ	and at	Variable 7:	Geomorphology	0.60	
ı	Abiotic and Biotic Habitat	Variable 8:	Chemical Environment	0.65	
L	Abia H	Variable 9:	Vegetation Structure and Complexity	0.65	
I	unction	al Capacity			E
F	unction 1	- Support of Cl	naracteristic Wildlife Habitat Total Functional		Functional Capacity
_	V1 _{wetloss}	+ V2 _{barriers} +	V3 _{buffer} + (2 x V9 _{veg}) Points	-2	Index
L	0.750	+ 0.650 +	0.600 + 1,300 + + = 3,30	÷ 5 =	0.660
			aracteristic Fish/aquatic Habitat		
(3	3 x V4 _{source})	+ (2 x V5 _{dist}) +	2 x V6 _{outflow} + V8 _{chem} + V7 _{geom}	_	
L	1.800	+ 1,200 +	1.200 + 0.650 + 0.600 + = 5.45	÷ 9 =	0.606
F	1438 J. Harris H. L. H. L.	- Flood Attenua			
_	V3 _{buffer}	+ '2 x V4 _{source} +	$(2 \times V5_{dist}) + 2 \times V6_{outflow} + V7_{geom} + V9_{veg}$	_	
L	0.600	+ 1.200 +	1.200 + 1,200 + 0.600 + 0.650 = 5.45	÷ 9 =[0.606
			ng-term Water Storage		
V	4 _{source}	+ (2 x V5 _{dist}) +	2 x V6 _{outflow}) V7 _{geom}		
		1,200 +	1,200 + 0.600 + + = 3.60	÷ 6 =[0.600
_		Nutrient/Toxic			
(2 x V5 _{dist})	+ V8 _{chem} +	V7 _{geom}	944	
	,200	0.650 +	0.600 + + + = 2.45	÷ 4 =[0.613
Fı		Sediment Rete	ention/Shoreline Stabilization		
_	V3 _{buffer}	(2 x V7 _{geo}) +	(2 x V9 _{veg})	_	
C	2.600 +	1.200 +	1.300 + + + = 3,10	÷ 5 =[0.620
			port/Food Chain Support		3
		2 x V6 _{outflow} +	V8 _{chem} + V7 _{geo} + (2 x V9 _{veg})	-	
(0.750 +	1.200 +	0.650 + 0.600 + 1.300 + = 4.5 +	+ 7 =	0.643
			Sum of Individual FCI So	ores	4.346
			Divide by the Number of Function	s Scored	÷ 7
			Composite FCI So	ore	0.621

ADMINISTRATIVE CHARACTERIZATION

General Informat	ion	Stormu	NATER AAS	Date of Evaluation:				
Site Name or ID:	Беси		2, 282-01	Project Name:	7 -7	E15		
404 or Other Permit Application #:			A	Applicant Name:	CDOT			
Evaluator Name(s):	R.MG	Dane	Evaluator's profes	ssional position and organization:	11-1-11 1 m 11	cientist		
Location Informa	tion:							
Site Location (Lat./Long. or UTM):	2.	STORMWA	HER BASINS	Geographic Datum Used (NAD 83	_			
		V		111112				
USGS Quadrangle Map:		City, Mon		Map Scale: (Circle one)	1:24,000 Other	1:100,000		
Sub basin Name (8 digit HUC):	10190003	- CHER	outh Platte -	Wetland Ownership:	Coot, priva			
Project Information This evaluation is being performed at: (Check applicable box)	on: → Project We Mitigation		Purpose of Evaluation (check all applicable):	Evaluation (check all Mitigation; Post-construction				
Intent of Project: (Check	k all applicable,		Restortation	☐ Enh	nancement	Creation		
Total Size of Wetland I (Record Area, Check and De Measurement Method Used)	escribe	ac.	Measured Estimated			2.		
Assessment Area (AA) Area, check appropriate box. Ad	dditional spaces	ac.	Measured	ac.	ac. ac.	ac.		
are used to record acreage wher AA is included in a single assess			Estimated		ac. ac.	ac.		
Characteristics or Method used for INCLUDED			BECAUSE THE	YARE AUR	Multiple polyGo LELATED TO STON SAME STRESSON	munter		
Sit€s Notes:	ARE ART	ificially	CREATED DE	pression	pl wetlane	DS.		

ECOLOGICAL DESCRIPTION 1

Special C	Concerns	Check all that apply					
	soils including Histosols on the AA (i.e., AA included			Federally thre			ed species are
including epipedor		Histosol soils or histic	W 10				
	soils are known to occur a us wetland of which the A		П				he Colorado Natural cur in the AA?
urbanize Federally	and is a habitat oasis in a d landscape? If threatened or endangers in the AA? List Below.			The site is locarea or eleme determined b Other special	ent occurrer y CNHP?	nce buffer	
to occur	in the AA? List below.						
	F	YDROGEOMOR	PHI	CSETTIN	IG		
AA wetla	and has been subject to o	ental natural hydrogeomo change in HGM classes a lescribe the original wetla	as a re	esult of anthro	pogenic m		
	nd was created from an						
Current C	onditions	norph	ic setting of t	he wetland	by circlin	ng all conditions	
		that apply.					
	Water source	Surface flow	Gı	roundwater	Precipi		Unknown
	Hydrodynamics	Unidirectional		Vertical	Bi-direc		
	Wetland Gradient	0 - 2%		2-4%	4-10%	>10	
	# Surface Inlets	Over-bank	0	1	2	3	>3
HGM Setting	# Surface Outlets		0	1	2	3	>3
	Geomorphic Setting (Narrative Description. Include approx. stream order for riverine)						
	HGM class	Riverine		Slope	Depres	sional	Lacustrine
Historical C	onditions						
	Water source	Surface flow	Gr	oundwater	Precipit	ation	Unknown
GO LIN DO PARAMENTA	Hydrodynamics	Unidirectional		Vertical			
Previous vetland typolog	Geomorphic Setting (Narrative						
	Previous HGM Class	Riverine		Slope	Depress	sional	Lacustrine
lotes (include	information on the AA's	HGM subclass and region	nal su	bclass):			

ECOLOGICAL DESCRIPTION 2

System	Subsystem	Class	Subclass	Water Regime	Other Modifiers	% A/
PALUSTRINE PALUSTRINE		EM	Persistent	BF	H X	50
	E PALUSTRIA		BL DECIDNOUS	B, F	H, x	50
	Littoral;				Hypersaline(7);	
Lacustrine Palustrine	Limnoral Palustrine Lower perennial; Upper perennial;	Rock Bot. (RB) Uncon Bottom(UB) Aquatic Bed(AB) Rocky Shore(RS) Uncon Shore(US) Emergent(EM) Shrub-scrub(SS)	Floating vascular; Rooted vascular; Algal; Persistent; Non-Persistent; Broad-leaved deciduous; Needle-leaved evergreen; Cobble - gravel;	Examples Temporarily flooded(A); Saturated(B); Seasonally flooded(C); Seasflood./sat.(E); Semi-Perm. flooded(F); Intermittently exposed(G), Artificially flooded(K);	Eusaline(8); Mixosaline(9); Fresh(0); Acid(a); Circumneutral(c); Alkaline/calcareous(I); Organic(g); Mineral(n); Beaver(b); Partially Drained/ditched(d);	
	Intermittent	Forested (FO)	Sand; Mud; Organic	Sat./semiperm./Seas. (Y); Int. exposed/permenant(Z)	Farmed(f); Diked/impounded(h); Artificial Substrate(r); Spoil(s); Excavated(x)	
Site Map	Intermittent	Forested (FO)	Organic e site including relevant por	Sat./semiperm./Seas. (Y); Int. exposed/permenant(Z)	Farmed(f); Diked/impounded(h); Artificial Substrate(r); Spoil(s); Excavated(x)	classes,
	Intermittent	Forested (FO)	Organic e site including relevant por	Sat./semiperm./Seas. (Y); Int. exposed/permenant(Z)	Farmed(f); Diked/impounded(h); Artificial Substrate(r); Spoil(s); Excavated(x)	classes,
	Intermittent	Forested (FO)	Organic e site including relevant por	Sat./semiperm./Seas. (Y); Int. exposed/permenant(Z)	Farmed(f); Diked/impounded(h); Artificial Substrate(r); Spoil(s); Excavated(x)	classes,
	Intermittent	Forested (FO)	Organic e site including relevant por	Sat./semiperm./Seas. (Y); Int. exposed/permenant(Z)	Farmed(f); Diked/impounded(h); Artificial Substrate(r); Spoil(s); Excavated(x)	classes,
	Intermittent	Forested (FO)	Organic e site including relevant por	Sat./semiperm./Seas. (Y); Int. exposed/permenant(Z)	Farmed(f); Diked/impounded(h); Artificial Substrate(r); Spoil(s); Excavated(x)	
	Intermittent	Forested (FO)	Organic e site including relevant por	Sat./semiperm./Seas. (Y); Int. exposed/permenant(Z)	Farmed(f); Diked/impounded(h); Artificial Substrate(r); Spoil(s); Excavated(x)	
	Intermittent	Forested (FO)	Organic e site including relevant por	Sat./semiperm./Seas. (Y); Int. exposed/permenant(Z)	Farmed(f); Diked/impounded(h); Artificial Substrate(r); Spoil(s); Excavated(x)	
	Intermittent	Forested (FO)	Organic e site including relevant por	Sat./semiperm./Seas. (Y); Int. exposed/permenant(Z)	Farmed(f); Diked/impounded(h); Artificial Substrate(r); Spoil(s); Excavated(x)	
	Intermittent	Forested (FO)	Organic e site including relevant por	Sat./semiperm./Seas. (Y); Int. exposed/permenant(Z)	Farmed(f); Diked/impounded(h); Artificial Substrate(r); Spoil(s); Excavated(x)	
	Intermittent	Forested (FO)	Organic e site including relevant por	Sat./semiperm./Seas. (Y); Int. exposed/permenant(Z)	Farmed(f); Diked/impounded(h); Artificial Substrate(r); Spoil(s); Excavated(x)	
	Intermittent	Forested (FO)	Organic e site including relevant por	Sat./semiperm./Seas. (Y); Int. exposed/permenant(Z)	Farmed(f); Diked/impounded(h); Artificial Substrate(r); Spoil(s); Excavated(x)	
	Intermittent	Forested (FO)	Organic e site including relevant por	Sat./semiperm./Seas. (Y); Int. exposed/permenant(Z)	Farmed(f); Diked/impounded(h); Artificial Substrate(r); Spoil(s); Excavated(x)	
	Intermittent	Forested (FO)	Organic e site including relevant por	Sat./semiperm./Seas. (Y); Int. exposed/permenant(Z)	Farmed(f); Diked/impounded(h); Artificial Substrate(r); Spoil(s); Excavated(x)	
	Intermittent	Forested (FO)	Organic e site including relevant por	Sat./semiperm./Seas. (Y); Int. exposed/permenant(Z)	Farmed(f); Diked/impounded(h); Artificial Substrate(r); Spoil(s); Excavated(x)	
	Intermittent	Forested (FO)	Organic e site including relevant por	Sat./semiperm./Seas. (Y); Int. exposed/permenant(Z)	Farmed(f); Diked/impounded(h); Artificial Substrate(r); Spoil(s); Excavated(x)	

Variable 1: Habitat Connectivity - Neighboring Wetland Habitat Loss

This variable is a measure of how isolated from other naturally-occurring wetland or riparian habitat the AA has become as a result of the loss of that habitat. To score this variable, estimate the percent of naturally-occurring wetland/riparian habitat that has been lost (by filling, draining, development, or whatever means) within a 500-meter-wide belt surrounding the AA. This surrounding area is called the Habitat Connectivity Envelope (HCE). Historical photographs and NWI and hydric soils maps can be helpful in scoring this variable. In most cases the evaluator must use best professional judgment in estimating the amount of natural wetland loss. Evaluation of landforms and habitat patterns in the context of perceivable land use change should be used to steer estimates of the amount of wetland loss within the HCE. This variable is not meant to penalize AAs that are naturally isolated, or unique to the landscape. Rather, it should measure the degree to which natural habitat connectivity has been lost.

Rules for Scoring:

- 1. On the aerial photo, create a 500 meter perimeter around the AA.
- 2. The area within this perimeter is the Habitat Connectivity Envelope (HCE).
- 3. Within the HCE, outline the current extent of naturally occurring wetland and riparian habitat. Do not include habitats such as excavated ponds or reservoir induced fringe wetlands.
- 4. Outline the historical extent of wetland and riparian habitats (i.e., existing natural wetlands plus those that have been destroyed).
- Use your knowledge of the history of the area and evident land use change to identify where habitat losses have occurred. Additional research could be utilized to increase the accuracy of this estimate including consideration of floodplain maps, historical aerial photographs, etc.
- Calculate the area of existing and historical wetlands. Divide the area values to determine the percentage of naturally occurring wetland habitat that remains in the HCE, and determine the variable score using the guidelines below.

Variable Score	Condition Category	Scoring Guidelines
1.0 - 0.9	Reference Standard	Wetland losses are absent or negligible or there is no evidence to suggest the native landscape within the HCE historically contained other wetland habitats
<0.9 - 0.8	Highly Functioning	More than 80% of historical wetland habitat area within the HCE is still present (less than 20% of habitat area lost).
<0.8 - 0.7	Functioning	80 to 60% of historical wetland habitat area within the HCE is still present (20% to 40% of habitat area lost).
<0.7 - 0.6	Functioning Impaired	Less than 60 to 25% of historical wetland habitat area within the HCE is still present (more than 40 to 75% of habitat area lost).
<0.6	Non- functioning	Less than 25% of the historical wetland habitat area within the HCE still in existence (more than 70% of habitat lost).

Variable 1 Score

NOT EVALUATED

Notes: BECAUSE THESE WETCANDS ARE NOVEL, THEY WERE NIEVER A COMPARENT OF "Historic WETCAND" "NEIGHTESMITOUS". CONSEQUENTLY THIS VANIABLE WAS NOT EVALUATED.

Variable 2: Habitat Connectivity - Migration/Dispersal Barriers

This variable is intended to rate the degree to which the AA has become isolated from existing neighboring wetland and riparian habitat by artificial barriers that inhibit migration or dispersal of organisms. On the aerial photograph, identify the man-made barriers within the HCE that intercede between the AA and surrounding wetlands and riparian areas, and identify them by type on the stressor list. Score this variable based on the barriers' impermeability to migration and dispersal and the amount of surrounding wetland/riparian habitat they affect.

Rules for Scoring:

- 1. On the aerial photo, outline all existing wetland and riparian habitat areas within the HCE. This includes naturally occurring habitats as well as those purposefully created or induced by land use change.
- 2. Identify artificial barriers to dispersal and migration of organisms within the HCE that intercede between the AA and surrounding habitats. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.
- 3. Considering the composite effect of all of identified barriers to migration and dispersal (i.e., stressors), assign an overall variable score using the scoring guidelines.

1	Stressors	Comments/description
, V	Major Highway	I-70
	Secondary Highway	CITY STREETS ON/OFF RAMPS
ē .	Tertiary Roadway	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
3	Railroad	
3	Bike Path	
	Urban Development	PANLING LOTS INDUSTRIAL/COMMERCIAL
5	Agricultural Development	1 100 (017)
,	Artificial Water Body	
	Fence	
	Ditch or Aqueduct	
	Aquatic Organism Barriers	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	Reference Standard	No appreciable barriers exist between the AA and other wetland and riparian habitats in the HCE; or there are no other wetland and riparian areas in the HCE.
<0.9 - 0.8	Highly Functioning	Barriers impeding migration/dispersal between the AA and up to 33% of surrounding wetland/riparian habitat highly permeable and easily passed by most organisms. Examples could include gravel roads, minor levees, ditches or barbed-wire fences. More significant barriers (see "functioning category below) could affect migration to up to 10% of surrounding wetland/riparian habitat.
<0.8 - 0.7	Functioning	Barriers to migration and dispersal retard the ability of many organisms/propagules to pass between the AA and up to 66% of wetland/riparian habitat. Passage of organisms and propagules through such barriers is still possible, but it may be constrained to certain times of day, be slow, dangerous or require additional travel. Busy two-lane roads, culverted areas, small to medium artificial water bodies or small earthen dams would commonly rate a score in this range. More significant barriers (see "functioning impaired" category below) could affect migration to up to 10% of surrounding wetland/riparian habitat.
<0.7 - 0.6	Functioning Impaired	Barriers to migration and dispersal preclude the passage of some types of organisms/propagules between the AA and up to 66% of surrounding wetland/riparian habitat. Travel of those animals which can potential negotiate the barrier are strongly restricted and may include a high chance of mortality. Up to 33% of surrounding wetland/riparian habitat could be functionally isolated from the AA.
<0.6	Non-functioning	AA is essentially isolated from surrounding wetland/riparian habitat by impermeable migration and dispersal barriers. An interstate highway or concrete-lined water conveyance canal are examples of barriers which would generally create functional isolation between the AA and wetland/riparian habitat in the HCE.

Most SitES ARE Completely ISOLATED.

Variable 2 Score 0,55

Variable 3: Buffer Capacity

The buffer area is defined as a 250-meter-wide belt surrounding the perimeter of the AA. This variable is a measure of the capacity of that area to function as an effective buffer for the wetland against the deleterious effects of surrounding land use change. To score the variable, assume that the AA is 100% buffered except where land use changes inside the buffer area have diminished this quality. Identify these land use types as specific stressors in the list. For each stressor, rate severity and extent within the buffer area; then use this list to make an overall rating for the buffer's departure from reference conditions. When rating buffer capacity, consider both the intensity of the impact and the proximity of the stressor to the AA.

Rules for Scoring:

- On the aerial photograph, delimit the buffer area (BA) as the zone within 250 meters of the outer boundary of the AA.
- 2. Use the stressor list to record land use changes that affect buffering capacity within the buffer area. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.
- 3. Considering all of the identified stressors, their composite severity, extent and proximity to the AA assign an overall variable score using the scoring guidelines.

TV	/	Stressors	Comments/description	
	1	Industrial/commercial		
	1	Urban		
" _		Residential		
		Rural		
		Dryland Farming		
		Intensive Agriculture		
		Orchards or Nurseries		
		Livestock Grazing		
V	/	Transportation Corridor	T-70	
		Urban Parklands		
-		Dams/impoundments		
		Artificial Water body		
E		Physical Resource Extraction		
		Biological Resource Extraction		

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	Reference Standard	No appreciable land use change has been imposed within the TBA and it provides the full buffering capacity.
<0.9 - 0.8	Highly Functioning	Some land use change has occurred in the BA, but such changes little impair the area's ability to provide a buffering function, either because land use is not intensive, for example haying, light grazing, or low intensity silviculture, or more substantial changes occur in approximately less than 10% of the BA.
<0.8 - 0.7	Functioning	BA has been subjected to a marked shift in land use, however, the land retains much of its original buffering capacity. Moderate-intensity land uses such as dry-land farming, urban "green" corridors, or moderate cattle grazing would commonly be placed within this scoring range.
<0.7 - 0.6	Functioning Impaired	Land use changes within the BA has been substantial including the a moderate to high coverage (up to 50%) of impermeable surfaces, bare soil, or other artificial surface; considerable in-flow urban runoff or fertilizer-rich waters common. While, the buffering capacity of the land has been greatly diminished it is not extinguished. Intensively logged areas, low-density urban developments, some urban parklands and some cropping situations would commonly rate a score within this range.
<0.6	Non-functioning	The area within the BA provides essentially no buffering capacity. Many Commercial developments or highly urban landscapes would rate a score of less than 0.6.

<0.6	Non-functioning	The area within the BA provides essentially no buffering capacity. Man developments or highly urban landscapes would rate a score of less that
Some But	HER CAPACITY,	But occurs within URBAN SETTINA
NEXT to	A MAJOR TR	ANSPORTATION CORRIDAR Variable 3 score

Variable 4: Water Source

This variable is concerned with up-gradient hydrologic connectivity. It is a measure of the impacts to the AA's water source, including the ability of source water to perform work such as sediment transport, erosion, soil pore flushing, etc. To score this variable, identify stressors that after the source of water to the AA, and record their presence on the stressor list. Stressors can impact water source by depletion, augmentation, or alteration of inflow timing or hydrodynamics. For riverine systems, this variable is primarily concerned with the connection of the channel to the floodplain. This variable is designed to assess water quantity, power and timing, not water quality. Water quality will be evaluated in Variable 8.

Scoring rules:

- 1. Use the stressor list and knowledge of the watershed to catalog type-specific impairments of the AA's water source. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.
- 2. Considering the composite effect of stressors on the water source, rate the condition of this variable with the aid of the scoring guidelines.

Stressors	Comments/description
Ditches or Drains (tile, etc.)	WATER IS ROUTED to HIESE AAS.
Dams	
Diversions	
Groundwater pumping	
Draw-downs	
Culverts or Constrictions	
Point Source (urban, ind., ag.)	
Non-point Source	
Increased Drainage Area	
Storm Drain/Urban Runoff	Built FUR HIS DURPOSE.
Impermeable Surface Runoff	
Irrigation Return Flows	
Mining/Natural Gas Extraction	
Transbasin Diversion	
Actively Managed Hydrology	
	Ditches or Drains (tile, etc.) Dams Diversions Groundwater pumping Draw-downs Culverts or Constrictions Point Source (urban, ind., ag.) Non-point Source Increased Drainage Area Storm Drain/Urban Runoff Impermeable Surface Runoff Irrigation Return Flows Mining/Natural Gas Extraction Transbasin Diversion

Variable Score	Condition Class	Depletion	Augmentation
1.0 - 0.9	Reference Standard	Unnatural drawdown events minor, rare or non- existent, very slight uniform depletion, or trivial alteration of hydrodynamics.	Unnatural high-water events minor, rare or non- existent, slight uniform increase in amount of inflow, or trivial alteration of hydrodynamics.
<0.9 - 0.8	Highly Functioning	Unnatural drawdown events occasional, short duration and/or mild; or uniform depletion up to 20%; or mild to moderate reduction of peak flows or capacity of water to perform work.	Occasional unnatural high-water events, short in duration and/or mild in intensity; or uniform augmentation up to 20%; or mild to moderate increase of peak flows or capacity of water to perform work.
<0.8 - 0.7	Functioning	Unnatural drawdown events common and of mild to moderate intensity and/or duration; or uniform depletion up to 50%; or moderate to substantial reduction of peak flows or capacity of water to perform work.	Common occurrence of unnatural high-water events, of a mild to moderate intensity and/or duration; or uniform augmentation up to 50%; or moderate to substantial increase of peak flows or capacity of water to perform work.
<0.7 - 0.6	Functioning Impaired	Unnatural drawdown events occur frequently with a moderate to high intensity and/or duration; or uniform depletion up to 75%; or substantial reduction of peak flows or capacity of water to perform work. Wetlands with actively managed or wholly artificial hydrology will usually score in this range or lower.	Common occurrence of unnatural high-water events, some of which may be severe in nature or exist for a substantial portion of the growing season; or uniform augmentation more than 50% or capacity of water to perform work. Wetlands with actively managed or wholly artificial hydrology will usually score in this range or lower.
<0.6	Non- functioning	Water source diminished enough to threaten or extinguish wetland hydrology in the AA.	Frequency, duration or magnitude of unnaturally high- water great enough to change the fundamental characteristics of the wetland.

FUNCTIONAL, BUT WATER SOURCE IS EARAPIC AND UNDREDICTIBLE.

Variable 4 Score

0.7

Variable 5: Water Distribution

This variable is concerned with hydrologic connectivity within the AA. It is a measure of alteration to the spatial distribution of surface and groundwater within the AA. These alterations are manifested as local changes to the hydrograph and generally result from geomorphic modifications. To score this variable, identify stressors that alter flow patterns and impact the hydrograph within the AA, including localized increases or decreases to the depth or duration of the water table or surface water. In most cases, the Water Source variable score will determine the maximum achievable score for Water Distribution, since the condition of the water source exerts a primary control on the wetland's capacity to distribute water in a characteristic fashion and exhibit a natural hydrograph.

Scoring rules:

- 1. Identify impacts to the natural distribution of water throughout the AA and catalog them in the stressor table.
- 2. Considering all of the stressors identified, assign an overall variable score using the scoring guidelines. In most cases, the Water Source variable score will set the upper limit for the Water Distribution score.

1	Stressors	Comments/description
	Alteration of Water Source	
	Ditches	
	Ponding/Impoundment	
	Culverts	
	Road Grades	
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Enlarged Channel	
	Artificial Banks/Shoreline	
	Weirs	
	Dikes/Levees/Berms	
	Diversions	
	Sediment/Fill Accumulation	
_		The state of the s

Variable Score	Condition Class	Non-riverine	Riverine
1.0 - 0.9	Reference Standard	Little or no alteration has been made to the way in which water is distributed throughout the wetland. AA maintains a natural hydrologic regime.	Natural active floodplain areas flood on a normal recurrence interval. No evidence of alteration of flooding and subirrigation duration and intensity.
<0.9 - 0.8	Highly Functioning	Less than 10% of the AA is affected by in situ hydrologic alteration; or more widespread impacts result in less than a 2 in. (5 cm) change in mean growing season water table elevation.	Channel-adjacent areas have occasional unnatural periods of drying or flooding; or uniform shift in the hydrograph less than typical root depth.
<0.8 - 0.7	Functioning	Between 10 and 33% of the AA is affected by in situ hydrologic alteration; or more widespread impacts result in a 4 in. (5 cm) or less change in mean growing season water table elevation.	In channel-adjacent area, periods of drying or flooding are common; or uniform shift in the hydrograph near root depth.
<0.7 - 0.6	Functioning Impaired	33 to 66% of the AA is affected by in situ hydrologic alteration; or more widespread impacts result in a 6 in. (15 cm) or less change in mean growing season water table elevation. Water table behavior must still meet jurisdictional criteria to merit this rating.	Adjacent to the channel, unnatural periods of drying or flooding are the norm; or uniform shift in the hydrograph greater than root depth.
<0.6	Non-functioning	More than 66% of the AA is affected by hydrologic alteration which changes the fundamental functioning of the wetland system, generally exhibited as a conversion to upland or deep water habitat.	Historical active floodplain areas are almost never wetted from overbank flooding, and/or groundwater infiltration is effectively cut off.

INTERNAL WATER DISTRIBUTION 13 typically Variable 5 Score

Variable 6: Water Outflow

This variable is concerned with down-gradient hydrologic connectivity and the flow of water (transporting materials and energy) out of the AA. It is a measure of impacts that affect the hydrologic outflow of water including the passage of water through its normal low- and high-flow surface outlets, and infiltration/groundwater recharge. In some cases, alteration of evapotranspiration rates may be significant enough of a factor to consider in scoring. Score this variable by identifying stressors that impact the means by which water is exported from the AA. In Variable 5, the stressors were evaluated in light of their impact on water distribution within the AA. To evaluate this variable focus on the AA's ability to export water, energy and associated materials to habitats down-gradient of the AA. In most cases, the Water Source variable score will determine the maximum achievable score for Water Outflow, since the condition of the water source exerts a primary control over the wetland's capacity to export water and associated materials,

Scoring rules:

- 1. Identify impacts to the natural outflow of water from the AA and catalog them in the stressor table.
- 2. Considering all of the stressors identified, assign an overall variable score using the scoring guidelines. Take in to account the cumulative effect of stressors on the wetland's ability to export water and water-borne materials. In most cases the Water Source variable will set the upper limit for the Water Outflow score.

V	Stressors	Comments/description
	Alteration of Water Source	
	Ditches	
	Dikes/Levees	
	Road Grades	
	Culverts	
	Diversions	
	Constrictions	
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Artificial Stream Banks	
	Weirs	
	Confined Bridge Openings	

Variable Score	Condition Class	Scoring Guidelines					
1.0 - 0.9	Reference Standard	Stressors have little to no effect on the magnitude, timing or hydrodynamics of the AA water outflow regime.					
<0.9 - 0.8	Highly Functioning	High- or low-water outflows are mildly to moderately affected, but at intermediate ("normal") levels flow continues essentially unaltered in quantity or character.					
<0.8 - 0.7	Functioning	High- or low-water outflows are moderately affected, mild alteration of intermediate level outflow occurs; or hydrodynamics moderately affected.					
<0.7 - 0.6	Functioning Impaired	Outflow at all stages is moderately to highly impaired resulting in persistent flooding of portions of the AA or unnatural drainage; or outflow hydrodynamics severely disrupted.					
<0.6	Non-functioning	The natural outflow regime is profoundly impaired. Down-gradient hydrologic connection severed or nearly so. Alterations may cause widespread unnatural persistent flooding or dewatering of the wetland system.					

THESE AAS ARE SEMI-CLOSED DEPRESSIONS, ONly PABLE to HAVE WATER OUTFLOW AT SPECIFIED ELEVATIONS OR AT A CENTAIN Variable 6 Score 0.7

THE PRIMARY AVENUES FOR WATER OUTFLOW ARE INFILTRATION AND ET.

THE WATER SOURCE MANIABLE IS MAIN FACTOR CONTROLLING THIS VANIABLE

Variable 7: Geomorphology

This variable is a measure of the degree to which the geomorphic setting has been altered within the AA. Changes to the surface configuration and natural topography constitute stressors. Such stressors may be observed in the form of fill, excavation, diking, sedimentation due to absence of flushing floods, etc. In riverine systems geomorphic changes to stream channel should be considered if the channel is within the AA. Alterations may include bed surface changes (embeddedness or morphology changes), stream bank instability, and stream channel reconfiguration. Geomorphic changes are usually ultimately manifested as changes to wetland hydrology and water relations with vegetation. Geomorphic alteration can also directly affect soil properties, such as near-surface texture, and the wetland chemical environment, such as the redox state or nutrient composition in the rooting zone. In rating this variable, do not include the resultant effects of geomorphic change; rather focus on the physical impacts within the footprint of the alteration. The effects of geomorphic change are addressed by other variables. All alterations to geomorphology should be evaluated including small-scale impacts such as pugging, hoof sheer, and sedimentation which constitute important, but not immediately apparent, impacts.

Scoring Rules:

- 1. Identify impacts to geomorphological setting and topography within the AA and record them on the stressor checklist.
- 2. Considering all of the stressors identified, assign an overall variable score using the scoring guidelines.

	Stressors		Comments				
V		Dredging/Excavation/Mining	OCCASSIONAL NEED to REMOVE SEDIMENT				
		Fill, including dikes, road grades, etc					
		Grading					
	a	Compaction					
	era	Plowing/Disking					
V	en	Excessive Sedimentation	DEPOSITIONAL ENV.				
	Q	Dumping					
		Hoof Shear/Pugging					
		Aggregate or Mineral Mining					
V		Sand Accumulation	DEMOSITIONAL ENV.				
		Channel Instability/Over Widening	7				
	nly.	Excessive Bank Erosion					
\neg	ō	Channelization					
	8	Reconfigured Stream Channels					
	ne	Artificial Banks/Shoreline					
	an	Beaver Dam Removal					
	C	Substrate Embeddedness					
	Part of	Lack or Excess of Woody Debris					
\neg							

Variable Score	Condition Class	Scoring Guidelines						
1.0 - 0.9	Reference Standard	Topography essentially unaltered from the natural state, or alterations appear to have a minimal effect on wetland functioning and condition. Patch or microtopographic complexity may be slightly altered, but native plant communities are still supported.						
<0.9 - 0.8	Highly Functioning	Alterations to topography result in small but detectable changes to habitat conditions in some or all of the AA; or more severe impacts exist but affect less than 10% of the AA.						
<0.8 - 0.7	Functioning	Changes to AA topography may be pervasive but generally mild to moderate in severity. May include patches of more significant habitat alteration; or more severe alterations affect up to 20 % of the AA.						
<0.7 - 0.6	Functioning Impaired	At least one important surface type or landform has been eliminated or created; microtopography has been strongly impacted throughout most or all of the AA; or more severe alterations affect up to 50% of the AA. Evidence that widespread diminishment or alteration of native plant community exist due to physical habitat alterations. Most incidentally created wetland habitat such as that created by roadside ditches and the like would score in this range or lower.						
<0.6	Non- functioning	Pervasive geomorphic alterations have caused a fundamental change in site character and functioning, commonly resulting in a conversion to upland or deepwater habitat.						

Novel wethough that there spontheneously formed. Variable 7 Score

0.65

Variable 8: Water and Soil Chemical Environment

This variable concerns the chemical environment of the soil and water media within the AA, including pollutants and water quality. The origin of pollutants may be in the AA or delivered from up-gradient or surrounding areas. Score this variable by listing indicators of chemical stress in the AA. Consider point source and non-point sources of pollution, as well as mechanical or hydrologic changes that alter the chemical environment. Because water quality frequently cannot be inferred directly, the presence of many stressors is identified via indirect indicators.

Scoring rules:

- Stressors are grouped into categories which have a similar signature or set of causes.
- 2. Use the indicator list to identify each stressor impacting the chemical environment of the AA.
- 3. For each stressor category, determine the sub-variable score using the scoring guideline table provided on the second page of the scoring sheet.
- -If the AA is part of a water body that is recognized as impaired or recommended for TMDL development for one of the factors, then score that sub-variable 0.65 or lower.
- 4. Transcribe sub-variable scores to the following variable scoring page and compute the sum.
- 5. Determine the variable score by following the scoring guidelines.

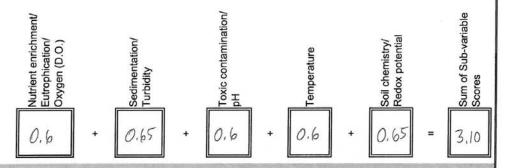
Stressor Category	Stressor Indicator	V	Comments	Sub-
	Livestock			variable
	Agricultural Runoff			Score
Nutrient Enrichment/	Septic/Sewage			
Eutrophication/	Excessive Algae or Aquatic Veg.			- 0.6
Oxygen (D.O.)	Cumulative Watershed NPS	V		
	CDPHE Impairment/TMDL List			\exists /
	Excessive Erosion			- (
	Excessive Deposition			\neg
	Fine Sediment Plumes			\neg \
Sedimentation/	Agricultural Runoff			1/1
Turbidity	Excessive Turbidity			0,65
ruibluity	Nearby Construction Site			7/
	Cumulative Watershed NPS	V		\neg /
	CDPHE Impairment/TMDL List			□/
	Recent Chemical Spills			- (
	Nearby Industrial Sites			
	Road Drainage/Runoff			
	Livestock			
	Agricultural Runoff			
LOVIC contamination/	Storm Water Runoff	V		0.
pH	Fish/Wildlife Impacts			0.6
Pri	Vegetation Impacts			
	Cumulative Watershed NPS			\neg /
	Acid Mine Drainage			\neg /
	Point Source Discharge			7/
	CDPHE Impairment/TMDL List			/
	Metal staining on rocks and veg.			7
	Excessive Temperature Regime	V		
[Lack of Shading	V		
	Reservoir/Power Plant Discharge			
Temperature	Industrial Discharge			0.6
	Cumulative Watershed NPS	V		
	CDPHE Impairment/TMDL List			\exists /
Į.	Unnatural Saturation/Desaturation			\dashv
Soil chemistry/	Mechanical Soil Disturbance	V		
Redox potential	Dumping/introduced Soil			0.65
Codox potential	CDPHE Impairment/TMDL List			

Variable 8: Water and Soil Chemical Environment

Sub-variable Scoring Guidelines

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	Reference Standard	Stress indicators not present or trivial.
<0.9 - 0.8	Highly Functioning	Stress indicators scarcely present and mild, or otherwise not occurring in more than 10% of the AA.
<0.8 - 0.7	Functioning	Stress indicators present at mild to moderate levels, or otherwise not occurring in more than 33% of the AA.
<0.7 - 0.6	Functioning Impaired	Stress indicators present at moderate to high levels, or otherwise not occurring in more than 66% of the AA
<0.6	Non-functioning	Stress indicators strongly evident throughout the AA at levels which apparently alter the fundamental chemical environment of the wetland system

Input each factor score from the stressor list and calculate the sum.



Use the table to score the Chemical Environment Variable circling the applicable scoring rules.

Variable	Condition	Scoring Rules							
Score	Class	Single Factor		Composite Score					
1.0 - 0.9	Reference Standard	No single factor scores < 0.9	or	The factor scores sum > 4.5					
<0.9 - 0.8	Highly Functioning	Any single factor scores ≥ 0.8 but < 0.9	or	The factor scores sum >4.0 but ≤4.5					
<0.8 - 0.7	Functioning	Any single factor scores ≥ 7.0 but < 0.8	or	The factor scores sum >3.5 but ≤ 4.0					
<0.7 - 0.6	Functioning Impaired	Any single factor scores ≥ 0.6 but <0.7	or	The factor scores sum >3.0 but ≤3.5					
< 0.6	Non- functioning	Any single factor scores < 0.6	or	The factor scores sum < 3.0					

Variable 8 Score

0.65

Variable 9: Vegetation Structure and Complexity

This variable is a measure of the condition of the wetland's vegetation relative to its native state. It is particularly relevant to the wetland's ability to perform higher-order functions such as support of wildlife populations, although it also affects primary functions such as flood-flow attenuation. Score this variable by listing stressors that have affected the diversity, composition and cover of each vegetation cover class that would normally be present for the wetland type being assessed. For this variable, stressor severity is a measure of how much each vegetation stratum differs functionally from its natural condition.

Rules for Scoring:

- 1. Determine the number and types of vegetation layers present within the AA. Make a judgment as to whether additional layers were historically present using direct evidence such as stumps, root wads or historical photographs. Indirect evidence such as local knowledge and expert opinion can also be used in this determination. Check each present or suspected vegetation layer in the third row of the table.
- 2. Do not score vegetation layers that would not normally be present in the wetland type being assessed.
- 3. Estimate the percent coverage of each vegetation layer. Aerial photographs can be helpful for this but are not required. In cases where a stratum has been thinned or removed, enter the expected coverage of that layer **not** the current percent coverage.
- 4. Enter the percent cover values as decimals in the row of the stressor table labeled "Percent Cover of Layer". Note, percentages will often sum to more than 100% (1.0).
- 5. Determine the severity of stressors acting on each individual canopy layers, indicating their presence with checks in the appropriate boxes of the stressor table.
- 6. Determine the sub-variable score for each valid vegetation layer using the scoring guidelines on the second page of the scoring sheet. Enter each sub-variable score in the appropriate cell of the row labeled "Veg. Layer Sub-variable Score"
- 7. Add the "Veg. Layer Sub-variable Scores" and enter the sum in the labeled cell to the right of the individual scores. Follow this same process for the "Percent Cover of Layer".
- 8. Divide the sum of "Veg. Layer Sub-variable Scores" by the total coverage of all layers scored. This product is the Variable 9 score. Enter this number in the labeled box at the bottom of this page.

		Vegetatio	n Layers	5	1
Layers Scored (check boxes to right to indicate scored layers)		V	V		
Stressor	Tree	Shrub	Herb	Aquatic	Comments
Noxious Weeds		1			
Exotic/Invasive spp.			V		
Tree Harvest					
Brush Cutting/Shrub Removal		V			
Livestock Grazing					
Excessive Herbivory					
Mowing/Haying			1/		
Herbicide					
Loss of Zonation/Homogenization			0		
Dewatering					
Over Saturation			/		
Percent Cover of Layer	×	+20+	90 +	X	= 110
Veg. Layer Sub- variable Score	<u> </u>	0.6	0.7		See sub-variable scoring guidelines on following page
Weighted Sub-variable Score	+	12+	63 +		= 75
				,	Variable 9 Score

Sub-variable 9 Scoring Guidelines:
Based on the list of stressors identified above, rate the severity of their cumulative effect on vegetation structure and complexity for each vegetation layer.

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	Reference Standard	Stressors not present or with an intensity low enough as to not detectably affect the structure, diversity or composition of the vegetation layer.
<0.9 - 0.8	Highly Functioning	Stressors present at intensity levels sufficient to cause detectable, but minor, changes in layer composition. Stress related change should generally be less than 10% for any given attribute (e.g., 10% cover of invasive, 10% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as high as 33% for a given attribute if stressors are confined to patches comprising less than 10% of the wetland.
<0.8 - 0.7	Functioning	Stressors present with enough intensity to cause significant changes in the character of vegetation, including alteration of layer coverage, structural complexity and species composition. The vegetatio layer retains its essential character though. AA's with a high proportion of non-native grasses will commonly fall in this class. Stress related change should generally be less than 33% for any given attribute (e.g., 33% cover of invasive, 33% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as much as 66% for a given attribute if stressors are confined to patches comprising less than 25% of the wetland.
<0.7 - 0.6	Functioning Impaired	Stressor intensity severe enough to cause profound changes to the fundamental character of the vegetation layer. Stress-related change should generally be less than 66% for any given attribute (e.g., 66% cover of invasive, 66% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as much as 80% of a given attribute if stressors are confined to patches comprising less than 50% of the wetland.
<0.6	Non- functioning	Vegetation layer has been completely removed or altered to the extent that is no longer comparable to the natural structure, diversity and composition.

FACWet Score Card

VARIABLE SCORE TABLE

Scoring Procedure:

- Transcribe variable scores from each variable data sheet to the corresponding cell in the variable score table.
 In each Functional Capacity Index (FCI) equation, enter the corresponding variable scores in the equation cells. Do not enter values in the crossed cells lacking labels.
- 3. Add the variable scores to calculate the total functional points achieved for each function.
- 4. Divide the total functional points achieved by the functional points possible. The typical number of total points possible is provided, however, if a variable is added or subtracted to FCI equation the total possible points must be adjusted
- 5. Calculate the Composite FCI, by adding the FCI scores and dividing by the total number of functions scored (usually 7).
- 6. If scoring is done directly in the Excel spreadsheet, all values will be transferred and calculated automatically.

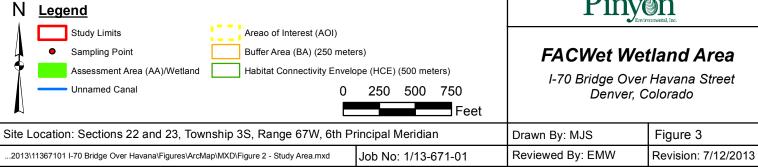
100 100 100 100 100 100 100 100 100 100	Condition and Engineering Section (Section)	10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
Buffer & Landscape Context	Variable 1:	Habitat Connectivity - Neighboring Wetland Habitat Loss	0.75	1
Buffer & andscape Context	Variable 2:	Habitat Connectivity - Migration/Dispersal Barriers	0.55	İ
g E O	Variable 3:	Buffer Capacity	0.60	
6	Variable 4:	Water Source	0.70	
Hydrology	Variable 5:	Water Distribution	0.70	
Ť	Variable 6:	Water Outflow	0.70	
t. II	Variable 7:	Geomorphology	0.65	
Abiotic and Biotic Habitat	Variable 8:	Chemical Environment	0.65	
Abjo H	Variable 9:	Vegetation Structure and Complexity	0.68	
Function	al Capacity			lii
Function 1	- Support of Cl	naracteristic Wildlife Habitat Total Functional		Functional Capacity
V1 _{wetloss}	+ V2 _{barriers} +	V3 _{buffer} + (2 x V9 _{veg}) Points	4.	Index
N/A	+ 0,55 +	0,60 + 1.36 + + = 2.51	÷ \$ =	0.628
		naracteristic Fish/aquatic Habitat		
(3 x V4 _{source})	+ (2 x V5 _{dist}) +	2 x V6 _{outflow} + V8 _{chem} + V7 _{geom}		
2.1	+ 1.4 +	1.4 + 0.65 + 0.65 + = 6.2	÷ 9 =	0.689
	- Flood Attenua			
V3 _{buffer}	+ (2 x V4 _{source} +	(2 x V5 _{dist}) + 2 x V6 _{outflow} + V7 _{geom} + V9 _{veg}		
0.60	+ 1,4 +	1.4 + 1.4 + 1.65 + 0.68 = 6.13	÷ 9 =	0.631
		ng-term Water Storage		
V4 _{source}	+ (2 x V5 _{dist}) +	2 x V6 _{outflow}) V7 _{georn}		
0.70	+ 1.4 +	1.4 + 0.65 + + = 4.15	÷ 6 = [0.692
	· Nutrient/Toxic			
(2 x V5 _{dist})	+ V8 _{chem} +	V7 _{geom}		
1,4	0.65 +	0.65 + + + = 2.7	÷ 4 =[0.675
		ention/Shoreline Stabilization		
V3 _{buffer}	(2 x V7 _{geo}) +			
0.60	1,30 +	1.36 + + + = 3,26	÷ 5 =	0.652
		port/Food Chain Support		
V1 _{wetloss} +	2 x V6 _{outflow} +	V8 _{chem} + V7 _{geo} + (2 x V9 _{veg})	6 1	
N/A +	1,40 +	0.65 + 0.65 + 1.36 + = 4.06	÷ 参 = [0.677
		Sum of Individual FCI S	cores	4.693
		Divide by the Number of Function	s Scored	÷ 7
		Composite FCI Se	core	0.670

Note:

The following FACWet forms were completed for wetlands delineated on April 12, 2013. To be consistent with the previous delineation's numbering structure, different wetland numbers were assigned in the body of this report. The table below reflects how the wetland numbers in the FACWet forms translate to those in the body of the report.

FACWet form Number	Wetland Technical Report Number
WL-1	WET280-08
WL-2	WET280-07
WL-3	Not included in the body of the report; outside of study area
WL-4	WET280-06





ADMINISTRATIVE CHARACTERIZATION

General Informat	ion				7/11/2013					
Site Name or ID:	WL-1	•			I-70 Bridge over Havana Street					
404 or Other Permit Application #:		Applicant Name:						СДОТ		
Evaluator Name(s):	Elly Weber			Evaluator's p	rofe	essional position and organization:	Biologist, Pinyon Environmental			
Location Informa	ation:									
Site Coordinates (Decimal Degrees, e.g., 38.85, -104.96):			024.408		Geographic Datum Used (NAD 83):	NAD 83				
00.00, 101.00).						Elevation	5293			
Location Information:		Inside inte	ercl	hange of Hava	ana	Street and I-70,	southeas	t quadrant		
Associated stream/waname:	ater body			N/A			Stream C	Stream Order:		
USGS Quadrangle Map:	Montbello					Map Scale: (Circle one)	х	1:24,000 Other	1:100,000 1:	
Sub basin Name (8 digit HUC):	10190003		Wetland Ownership:			CDOT				
Project Informati	on:				х	Potentially Impa	cted Wetl	ands		
This evaluation is being performed at: (Check applicable box)		tland (check all applicable): Mitigation (Mitigation)		Mitigation; Pre-o Mitigation; Post- Monitoring Other (Describe)	ost-construction					
Intent of Project: (Che	ck all applicable)			Restoration		☐ En	hancemen		Creation	
Total Size of Wetland (Record Area, Check and I Measurement Method Use	Describe	0.0119 ac.	Х	Measured Estimated						
Assessment Area (AA Area, check appropriate box. A		e 0.0119 ac.		Measured		ac.	ac.	ac.	ac.	
used to record acreage when more than one AA is included in a single assessment)		0.0119 ac.		Estimated		ac.	ac.	ac.	ac.	
Characteristics or Met AA boundary determin	The AA bou	ınd	ary is the bou	nda	ary of the wetland	d located v	wholly within	the AOI.		
Notes: WL-1 is	s in a low spot i	n the interch	nan	ge, east of Ha	ava	ina Street, south	of I-70.			

ECOLOGICAL DESCRIPTION 1

0 1 - 0						
Special Co		Check all that apply				
	s including Histosols or late AA (i.e., AA includes				eatened or endangered D to occur in the AA?	species are
	directly impact organic seas possessing either H					
	s are known to occur an wetland of which the AA				oncern according to the NHP) are known to occur	
The wetland urbanized la	d is a habitat oasis in an andscape?	otherwise dry or			ocated within a potential occurrence buffer area as	
	reatened or endangered AA? List Below.	species are KNOWN to		Other specia	al concerns (please descr	ribe)
	ŀ	IYDROGEOMOR	PHI	C SETTI	NG	
AA wetland	maintains its fundame	ntal natural hydrogeomo	orphic	characterist	ics	
AA wetland	has been subject to cl	nange in HGM classes a	s a re	sult of anthr	opogenic modification	ow.
_	was created from an u	9	ina iy	oe ii discerrie	able using the table belo	ow.
			morph	nic setting of	the wetland by circling	all conditions
Current Co	nditions	that apply.	σ.ρ.			
	Water source	Surface flow	G	Groundwater	Precipitation	Unknown
	Hydrodynamics	Inidirectional		Vertical	Bi-directional	
	Wetland Gradient	- 2%	<u>。</u>	2-4%	4-10% >10%	D
	# Surface Inlets	Over-bank	0	1) 2 3	>3
HGM Setting	# Surface Outlets	(0)	1	2 3 >	3
TION Setting	Geomorphic Setting (Narrative Description. Include approx. stream order for riverine)	This wetland is a depre water drainage in the I-			•	collects surface
	HGM class	Riverine		Slope	Depressional	Lacustrine
Historical Co	nditions					
	Water source	Surface flow	G	Groundwater	Precipitation	Unknown
	Hydrodynamics	Unidirectional		Vertical		
Previous wetland typology	Geomorphic Setting (Narrative Description)	This wetland has presu	ımably	not change	d since its formation.	
	Previous HGM Class	Riverine	,	Slope	Depressiona	Lacustrine
Notes (include in	formation on the AA's I	HGM subclass and region	onal si	ubclass):		

ECOLOGICAL DESCRIPTION 2

Vegetatio System		heve	Δm		Clas	c		Sı	ıbcla	SS			\/\/a+	r Ro	aima	<u> </u>	Oth	ner M	1odifi	ers	%	ΔΛ
Palustrine	Subsystem Palustrine				EM		F			scula	ar	Water Regime E		,	Ott	ici iv	iodili	CIS		00		
raiustille	Fa	liusti			EIVI			KOOLE	eu va	SCUIA	41			E							10	00
acustrine alustrine iverine	Littoral; Limnoral Palustrine Rock Bot. (RB) Uncon Bottom(UB) Aquatic Bed(AB) Rocky Shore(RS) Upcon Perennial; Upper perennial; Upper perennial; Intermittent Rock Bot. (RB) Uncon Bore(UB) Aquatic Bed(AB) Rocky Shore(RS) Upcon Shore(LS) Semi-Pernistent; Somi-Pernistent; Somi-P		ine(8); 9); Fres umneut Icareou Minera); Partia litched(ed(f); oundec ubstrate	sh(0); tral(c); us(i); al(n); ally (d); d(h); e(r);																		
Site Map						ap of to			ding r	elevai	nt port	ions d	of the	wetlar	nd, AA	bour	idary,	struct	ures, i	habita	t class	ses
See Figure 3	,																					

Variable 1: Habitat Connectivity

The Habitat Connectivity Variable is described by two sub-variables – Neighboring Wetland and Riparian Habitat Loss and Barriers to Migration and Dispersal. These sub-variables were treated as independent variables in FACWet Version 2.0. The merging of these variables makes their structure more consistent with that of other composite variables in FACWet. The new variable configuration also makes this landscape variable more accurately reflect the interactions amongst aquatic habitats in Colorado's agricultural and urbanized landscapes, which have a naturally low density of wetlands. The two Habitat Connectivity Sub-variables are scored in exactly the same manner as their FACWet 2.0 counterparts, as described below. The Habitat Connectivity Variable score is simply the arithmetic average of the two sub-variable scores which is entered on the second page of the Variable 1.1 is not scored.

SV 1.1 - Neighboring Wetland and Riparian Habitat Loss

(Do not score if few or no wetlands naturally exist in the HCE)

This sub-variable is a measure of how isolated from other naturally-occurring wetlands or riparian habitat the AA has become as the result of habitat destruction. To score this sub-variable, estimate the percent of naturally-occurring wetland/riparian habitat that has been lost (by filling, draining, development, or whatever means) within the 500-meter-wide belt surrounding the AA. This zone is called the Habitat Connectivity Envelope (HCE). In most cases the evaluator must use best professional judgment to estimate the amount of natural wetland loss. Historical photographs, National Wetland Inventory (NWI) maps, hydric soil maps can be helpful in making these determinations. Floodplain maps are especially valuable in river-dominated regions, such as the Front Range urban corridor. Evaluation of landforms and habitat patterns in the context of perceivable land use change is used to steer estimates of the amount of wetland loss within the HCE.

Rules for Scoring:

- 1. On the aerial photo, create a 500 m perimeter around the AA.
- 2. The area within this perimeter is the Habitat Connectivity Envelope (HCE).
- 3. Within the HCE, outline the current extent of naturally occurring wetland and riparian habitat. Do not include habitats such as excavated ponds or reservoir induced fringe wetlands.
- 4. Outline the historical extent of wetland and riparian habitats (i.e., existing natural wetlands plus those that have been destroyed).
- Use your knowledge of the history of the area and evident land use change to identify where habitat losses have occurred. Additional research can be utilized to increase the accuracy of this estimate including consideration of floodplain maps, historical aerial photographs, soil maps, etc.
- 5. Calculate the area of existing and historical wetlands. Divide the area of existing wetland by the total amount of existing and historical wetland and riparian habitat, and determine the variable score using the guidelines below. Enter sub-variable score at the bottom of p.2 of the Habitat Connectivity data form.

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	A Reference Standard	Wetland losses are absent or negligible or there is no evidence to suggest the native landscape within the HCE historically contained other wetland habitats
<0.9 - 0.8	B Highly Functioning	More than 80% of historical wetland habitat area within the HCE is still present (less than 20% of habitat area lost).
<0.8 - 0.7	C Functioning	80 to 60% of historical wetland habitat area within the HCE is still present (20% to 40% of habitat area lost).
<0.7 - 0.6	D Functioning Impaired	Less than 60 to 25% of historical wetland habitat area within the HCE is still present (more than 40 to 75% of habitat area lost).
<0.6	F Non- functioning	Less than 25% of the historical wetland habitat area within the HCE still in existence (more than 70% of habitat lost).

	mpanoa	
<0.6		Less than 25% of the historical wetland habitat area within the HCE still in existence (more than 70% of habitat lost).
	-	
Notes:		

Variable 1: Habitat Connectivity p. 2

SV 1.2: Migration/Dispersal Barriers

This sub-variable is intended to rate the degree to which the AA has become isolated from existing neighboring wetland and riparian habitat by artificial barriers that inhibit migration or dispersal of organisms. On the aerial photograph, identify the man-made barriers within the HCE that intercede between the AA and surrounding wetlands and riparian areas, and identify them by type on the stressor list. Score this variable based on the barriers' impermeability to migration and dispersal and the amount of surrounding wetland/riparian habitat they affect.

Rules for Scoring:

- 1. On the aerial photo, outline **all** existing wetland and riparian habitat areas within the HCE. This includes naturally occurring habitats, as well as those purposefully created or induced by land use change.
- 2. Identify artificial barriers to dispersal and migration of organisms within the HCE that intercede between the AA and surrounding habitats. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.
- 3. Considering the composite effect of all of identified barriers to migration and dispersal (i.e., stressors), assign an overall variable score using the scoring guidelines.

	√	Stressors	Comments/description
<i>"</i>	Х	Major Highway	I-70
ers		Secondary Highway	
barriers	Х	Tertiary Roadway	Havana Street
	Х	Railroad	Railroad spur on the west side of Havana Street, and to the SE
<u>S</u> .		Bike Path	
artificial	Х	Urban Development	Commercial, and light industrial area in Denver Metro Area
la la		Agricultural Development	
		Artificial Water Body	
Stressors		Fence	
es	Х	Ditch or Aqueduct	Concrete-lined ditch in northeast portion of study area
Str		Aquatic Organism Barriers	

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	A Reference Standard	No appreciable barriers exist between the AA and other wetland and riparian habitats in the HCE; or there are no other wetland and riparian areas in the HCE.
<0.9 - 0.8	B Highly Functioning	Barriers impeding migration/dispersal between the AA and up to 33% of surrounding wetland/riparian habitat highly permeable and easily passed by most organisms. Examples could include gravel roads, minor levees, ditches or barbed-wire fences. More significant barriers (see "functioning category below) could affect migration to up to 10% of surrounding wetland/riparian habitat.
<0.8 - 0.7	C Functioning	Barriers to migration and dispersal retard the ability of many organisms/propagules to pass between the AA and up to 66% of wetland/riparian habitat. Passage of organisms and propagules through such barriers is still possible, but it may be constrained to certain times of day, be slow, dangerous or require additional travel. Busy two-lane roads, culverted areas, small to medium artificial water bodies or small earthen dams would commonly rate a score in this range. More significant barriers (see "functioning impaired" category below) could affect migration to up to 10% of surrounding wetland/riparian habitat.
<0.7 - 0.6	D Functioning Impaired	Barriers to migration and dispersal preclude the passage of some types of organisms/propagules between the AA and up to 66% of surrounding wetland/riparian habitat. Travel of those animals which can potential negotiate the barrier are strongly restricted and may include a high chance of mortality. Up to 33% of surrounding wetland/riparian habitat could be functionally isolated from the AA.
<0.6	F Non-functioning	AA is essentially isolated from surrounding wetland/riparian habitat by impermeable migration and dispersal barriers. An interstate highway or concrete-lined water conveyance canal are examples of barriers which would generally create functional isolation between the AA and wetland/riparian habitat in the HCE.

SV 1.1 Score		Add S scores
SV 1.2 Score	0.58	two vai

Add SV 1.1 and 1.2 scores and divide by two to calculate variable score

Variable 1 Score

0.58

Variable 2: Contributing Area

The AA's Contributing Area is defined as the 250-meter-wide zone surrounding the perimeter of the AA. This variable is a measure of the capacity of that area to support characteristic functions of high quality wetland habitat. Depending on its condition, the contributing area can help maintain wetland condition or it can degrade it. Contributing Area condition is evaluated by considering the AA's Buffer and its Surrounding Land Use. Buffers are strips or patches of more-or-less natural upland and/or wetland habitat more than 5m wide. Buffers are contiguous with the AA boundary and they intercede between it and more intensively used lands. The AA Buffer is characterized with three sub-variables: Buffer Condition, Buffer Extent, and Average Buffer Width. The Surrounding Land Use Sub-variable considers changes within the Contributing Area that limit its capacity to support characteristic wetland functions. Many of the acute, on-site effects of land use change in the Contributing Area are specifically captured by Variables 3 - 8.

Rules for Scoring:

- 1. Delimit the Contributing Area on an aerial photograph as the zone within 250 meters of the outer boundary of the AA.
- 2. Evaluate and then rate the Buffer Condition sub-variable using the scoring guidelines. Record the score in the cell provided on the datasheet.
- 3. Indicate on the aerial photograph zones surrounding the AA which have ≥5m of buffer vegetation and those which do not.
- 4. Calculate the percentage of the AA which has a Buffer and record the value where indicated on the data sheet.
- 5. Rate the Buffer Extent Sub-variable using the scoring guidelines.
- 6.Determine the average Buffer width by drawing a line perpendicularly from the AA boundary to the outer extent of the buffer habitat. Measure line length and record its value on the data sheet. Repeat this process until a total of 8 lines have been sampled.
- 7. Calculate the average buffer width and record value on the data form. Then determine the sub-variable score using the scoring guidelines.
- 8.Score the Surrounding Land Use sub-variable by recording land use changes on the stressor list that affect the capacity of the landscape to support characteristic wetland functioning.
- 9. Enter the lowest of the three Buffer sub-variable scores along with the Surrounding Land Use Sub-variable score in the Contributing Area Variable scoring formula at the bottom of p. 2 of the data form. The Contributing Area Variable is the average of the two sub-variable scores.

SV 2.1 - Buffer Condition

0.57 SV 2.1 - Buffer Condition Score

Subvariable Score	Condition Grade	Buffer Condition Scoring Guidelines
1.0 - 0.9	Reference Standard	Buffer vegetation is predominately native vegetation, human-caused disturbance of the substrate is not evident, and human visitation is minimal. Common examples: Wilderness areas, undeveloped forest and range lands.
<0.9 - 0.8	Highly Functioning	Buffer vegetation may have a mixed native-nonnative composition, but characteristic structure and complexity remain. Soils are mostly undisturbed or have recovered from past human disturbance. Little or only low-impact human visitation. Buffers with higher levels of substrate disturbance may be included here if the buffer is still able to maintain predominately native vegetation. Common examples: Dispursed camping areas in national forests, common in wildland parks (e.g. State Parks) and open spaces.
<0.8 - 0.7	Functioning	Buffer vegetation is substantially composed of non-native species. Vegetation structure may be somewhat altered, such as by brush clearing. Moderate substrate distrbance and compaction occurs, and small pockets of greater disturbance may exist. Common examples: City natural areas, mountain hay meadows.
<0.7 - 0.6	Functioning Impaired	Buffer vegetation is substantially composed of non-native species and vegetation structure has been strongly altered by the complete removal of one or more strata. Soil disturbance and the intensity of human visitation are generally high. Common examples: Open lands around resource extraction sites (e.g., gravel mines), clear cut logging areas, ski slopes.
<0.6	Non-functionina	Buffer is nearly or entirely absent.

SV 2.2 - Buffer Extent

0.00 Precent of AA with Buffer

0.55 SV 2.2 - Buffer Extent

Subvariable Score	Condition Class	% Buffer Scoring Guidelines
1.0 - 0.9	Reference Standard	90 - 100% of AA with Buffer
<0.9 - 0.8	Highly Functioning	70-90% of AA with Buffer
<0.8 - 0.7	Functioning	51-69% of AA with Buffer
<0.7 - 0.6	Functioning Impaired	26-50% of AA with Buffer
<0.6	Non-functioning	0-25% of AA with Buffer

	Variable 2: Contributing Area (p. 2)											
					Area	(p. 2)						
SV 2.	3 - <i>F</i>	Average I	Buffer W	/idth		Record r	neasu	red buffer	widths in t	he space	es below and average.	
Buffer		0	0 0									
Width	` '	1	2	3	4	<u>0</u> 5	<i>0</i>	7	<i>0</i>	Avg. B	<u>∬</u> uffer Width (m)	
		1 2 3				Subvaria		Condition	n Grade	Buffer Width Scoring Guidelines		s
	1	SV 2.3	- Avera	ae Bu	ffer	1.0 - 0	-	Reference	Standard	Average	e Buffer width is 190-250m	n
0.1			/idth So	_		<0.9 - 0	_	Highly Fun		Average	e Buffer width is 101-189m	1
						<0.8 - 0).7	Functio	ning	Averag	ge Buffer width is 31-100m	
						<0.7 - 0).6	Functioning	Impaired		age Buffer width is 6-30m	
						<0.6		Non-func	tioning	Avera	age Buffer width is 0-5m	
SV 2.	4 - 8	Surround	ling Lan	d Use								_
		/ 2.4 - 8			1							
0.5	اد	Land U				Catalog landscap			land use	changes	in the surrounding	
	V	Stresso	rs		Comme	ents/des	cripti	on				\Box
	х	Industria	al/comme	ercial							OT maintenance faci	ilit
es	Х	Urban			High De	ensity de	velop	ment in D	enver an	d Comm	nerce City	_
ang		Residen	tial									4
Ch		Rural	Farming									-
lse			e Agriculi									-
= Land Use Changes		•	s or Nurs									7
Lan		Livestoc	k Grazin	g								
=	Х		rtation C		Interstate 70 and Havana interchange							
sors		Urban Parklands										
Stressors		Dams/impoundments										-
Str	Artificial Water body Physical Resource Extraction											
			Biological Resource Extraction									コ
Varia Sco		Condition	on Grade			,	Scoring G	Suideline	es			
1.0 -	0.9	Reference	4 e Standard	No appre	ciable land	use chang	e has t	een impose	d Surround	ling Lands	cape.	
<0.9	- 0.8		B unctioning	Some land use change has occurred in the Surrounding Landscape, but changes have minimal effect on the the landscape's capacity to support characteristic aquatic functioning, either because land use is not intensive, for example haying, light grazing, or low intensity silviculture, or more substantial changes occur in approximately less than 10% of the area.					÷			
<0.8	- 0.7		C tioning	much of it sediment.	ing Landscape has been subjected to a marked shift in land use, however, the land retains ts capacity to support natural wetland function and it is not an overt source of pollutants or Moderate-intensity land uses such as dry-land farming, urban "green" corridors, or cattle grazing would commonly be placed within this scoring range.							
<0.7 - 0.6		Funct	D tioning aired	to high co considera has been urban dev	overage (up able in-flow greatly dim	ges within the Surrounding Landscape has been substantial including the a moderate ge (up to 50%) of impermeable surfaces, bare soil, or other artificial surfaces; inflow urban runoff or fertilizer-rich waters common. Supportive capacity of the land ty diminished but not totally extinguished. Intensively logged areas, low-density ments, some urban parklands and many cropping situations would commonly rate a s range.					d	
<0.6		F ecologica			wetland ha	bitats.	Commercia			nerwise a cause of severe ghly urban landscapes		
		Buffer So			unding d Use							
	(0.1	+	0.5)÷	2		= Var	iable 2	2 Scoi	re 0.30	

Variable 3: Water Source

This variable is concerned with **up-gradient** hydrologic connectivity. It is a measure of impacts to the AA's water source, including the quantity and timing of water delivery, and the ability of source water to perform work such as sediment transport, erosion, soil pore flushing, etc. To score this variable, identify stressors that alter the source of water to the AA, and record their presence on the stressor list. Stressors can impact water source by depletion, augmentation, or alteration of inflow timing or hydrodynamics. This variable is designed to assess water quantity, power and timing, not water quality. Water quality will be evaluated in Variable 7.

Scoring rules:

- 1. Use the stressor list and knowledge of the watershed to catalog type-specific impairments of the AA's water source. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.
- 2. Considering the composite effect of stressors on the water source, rate the condition of this variable with the aid of the scoring guidelines.

√	Stressors	Comments/description
	Ditches or Drains (tile, etc.)	
	Dams	
	Diversions	
	Groundwater pumping	
	Draw-downs	
	Culverts or Constrictions	
	Point Source (urban, ind., ag.)	
	Non-point Source	
	Increased Drainage Area	
	Storm Drain/Urban Runoff	
×	Impermeable Surface Runoff	I-70 interchange and surrounding commercial and industrial area
	Irrigation Return Flows	
	Mining/Natural Gas Extraction	
	Transbasin Diversion	
	Actively Managed Hydrology	

Variable Score	Condition Grade	Depletion	Augmentation
1.0 - 0.9	A Reference Standard	Unnatural drawdown events minor, rare or non- existent, very slight uniform depletion, or trivial alteration of hydrodynamics.	Unnatural high-water events minor, rare or non- existent, slight uniform increase in amount of inflow, or trivial alteration of hydrodynamics.
<0.9 - 0.8	B Highly Functioning	Unnatural drawdown events occasional, short duration and/or mild; or uniform depletion up to 20%; or mild to moderate reduction of peak flows or capacity of water to perform work.	Occasional unnatural high-water events, short in duration and/or mild in intensity; or uniform augmentation up to 20%; or mild to moderate increase of peak flows or capacity of water to perform work.
<0.8 - 0.7	C Functioning	Unnatural drawdown events common and of mild to moderate intensity and/or duration; or uniform depletion up to 50%; or moderate to substantial reduction of peak flows or capacity of water to perform work.	Common occurrence of unnatural high-water events, of a mild to moderate intensity and/or duration; or uniform augmentation up to 50%; or moderate to substantial increase of peak flows or capacity of water to perform work.
<0.7 - 0.6	D Functioning Impaired	Unnatural drawdown events occur frequently with a moderate to high intensity and/or duration; or uniform depletion up to 75%; or substantial reduction of peak flows or capacity of water to perform work. Wetlands with actively managed or wholly artificial hydrology will usually score in this range or lower.	Common occurrence of unnatural high-water events, some of which may be severe in nature or exist for a substantial portion of the growing season; or uniform augmentation more than 50% or capacity of water to perform work. Wetlands with actively managed or wholly artificial hydrology will usually score in this range or lower.
<0.6	F Non- functioning	Water source diminished enough to threaten or extinguish wetland hydrology in the AA.	Frequency, duration or magnitude of unnaturally high-water great enough to change the fundamental characteristics of the wetland.

Variable 3 Score

Variable 4: Water Distribution

This variable is concerned with hydrologic connectivity within the AA. It is a measure of alteration to the spatial distribution of surface and groundwater within the AA. These alterations are manifested as local changes to the hydrograph and generally result from geomorphic modifications within the AA. To score this variable, identify stressors within the AA that alter flow patterns and impact the hydrograph of the AA, including localized increases or decreases to the depth or duration of the water table or surface water.

Because the wetland's ability to distribute water in a characteristic fashion is fundamentally dependent on the condition of its water source, in most cases the Water Source variable score will define the upper limit Water Distribution score. For example, if the Water Source variable is rated at 0.85, the Water Distribution score will usually have the potential to attain a maximum score of 0.85. Additional stressors within or outside the lower end of the AA effecting water distribution (e.g., ditches and levees) will reduce the score from the maximum value.

Scoring rules:

- 1. Identify impacts to the natural distribution of water throughout the AA and catalog them in the stressor table.
- 2. Considering all of the stressors identified, assign an overall variable score using the scoring guidelines. In most cases, the Water Source variable score will set the upper limit for the Water Distribution score.

√	Stressors	Comments/description
×	Alteration of Water Source	See variable 3: water source
	Ditches	
	Ponding/Impoundment	
	Culverts	
	Road Grades	
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Enlarged Channel	
	Artificial Banks/Shoreline	
	Weirs	
	Dikes/Levees/Berms	
	Diversions	
	Sediment/Fill Accumulation	

Variable Score	Condition Grade	Non-riverine	Riverine
1.0 - 0.9	Reference Standard	Little or no alteration has been made to the way in which water is distributed throughout the wetland. AA maintains a natural hydrologic regime.	Natural active floodplain areas flood on a normal recurrence interval. No evidence of alteration of flooding and subirrigation duration and intensity.
<0.9 - 0.8	B Highly Functioning	Less than 10% of the AA is affected by <i>in situ</i> hydrologic alteration; or more widespread impacts result in less than a 2 in. (5 cm) change in mean growing season water table elevation.	Channel-adjacent areas have occasional unnatural periods of drying or flooding; or uniform shift in the hydrograph less than typical root depth.
<0.8 - 0.7	C Functioning	Between 10 and 33% of the AA is affected by in situ hydrologic alteration; or more widespread impacts result in a 4 in. (5 cm) or less change in mean growing season water table elevation.	In channel-adjacent area, periods of drying or flooding are common; or uniform shift in the hydrograph near root depth.
<0.7 - 0.6	D Functioning Impaired	33 to 66% of the AA is affected by in situ hydrologic alteration; or more widespread impacts result in a 6 in. (15 cm) or less change in mean growing season water table elevation. Water table behavior must still meet jurisdictional criteria to merit this rating.	Adjacent to the channel, unnatural periods of drying or flooding are the norm; or uniform shift in the hydrograph greater than root depth.
<0.6	F Non-functioning	More than 66% of the AA is affected by hydrologic alteration which changes the fundamental functioning of the wetland system, generally exhibited as a conversion to upland or deep water habitat.	Historical active floodplain areas are almost never wetted from overbank flooding, and/or groundwater infiltration is effectively cut off.

Variable 4 Score

Variable 5: Water Outflow

This variable is concerned with down-gradient hydrologic connectivity and the flow of water and water-borne materials and energy out of the AA. In particular it illustrates the degree to which the AA can support the functioning of down-gradient habitats. It is a measure of impacts that affect the hydrologic outflow of water including the passage of water through its normal low- and high-flow surface outlets, infiltration/groundwater recharge, and the energetic characteristics of water delivered to dependent habitats. In some cases, alteration of evapotranspiration rates may be significant enough of a factor to consider in scoring. Score this variable by identifying stressors that impact the means by which water is exported from the AA. To evaluate this variable focus on how water, energy and associated materials are exported out of the AA and their ability it support down-gradient habitats in a manner consistent with their HGM (regional) subclass.

Because the wetland's ability to export water and materials in a characteristic fashion is to a very large degree dependent the condition of its water source, as with the Water Distribution variable, in most cases the Water Source variable score will define the upper limit Water Outflow score.

Scoring rules:

- 1. Identify impacts to the natural outflow of water from the AA and catalog them in the stressor table.
- 2.Considering all of the stressors identified, assign an overall variable score using the scoring guidelines. Take in to account the cumulative effect of stressors on the wetland's ability to export water and water-borne materials. In most cases the Water Source variable will set the upper limit for the Water Outflow score.

\	Stressors	Comments/description
×	Alteration of Water Source	See variable 3: water source
	Ditches	
	Dikes/Levees	
×	Road Grades	Low area caused by road grades surrounding AA, preventing water outflow
	Culverts	
	Diversions	
	Constrictions	
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Artificial Stream Banks	
	Weirs	
	Confined Bridge Openings	

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	A Reference Standard	Stressors have little to no effect on the magnitude, timing or hydrodynamics of the AA water outflow regime.
<0.9 - 0.8	B Highly Functioning	High- or low-water outflows are mildly to moderately affected, but at intermediate ("normal") levels flow continues essentially unaltered in quantity or character.
<0.8 - 0.7	C Functioning	High- or low-water outflows are moderately affected, mild alteration of intermediate level outflow occurs; or hydrodynamics moderately affected.
<0.7 - 0.6	D Functioning Impaired	Outflow at all stages is moderately to highly impaired resulting in persistent flooding of portions of the AA or unnatural drainage; or outflow hydrodynamics severely disrupted.
<0.6	F Non-functioning	The natural outflow regime is profoundly impaired. Down-gradient hydrologic connection severed or nearly so. Alterations may cause widespread unnatural persistent flooding or dewatering of the wetland system.

Variable 5 Score

Variable 6: Geomorphology

This variable is a measure of the degree to which the geomorphic setting has been altered within the AA. Changes to the surface configuration and natural topography constitute stressors. Such stressors may be observed in the form of fill, excavation, dikes, sedimentation due to absence of flushing floods, etc. In riverine systems, geomorphic changes to the stream channel should be considered if the channel is within the AA (i.e, small is size). Alterations may involve the bed and bank (substrate embeddedness or morphological changes), stream instability, and stream channel reconfiguration. Geomorphic changes are usually ultimately manifested as changes to wetland surface hydrology and water relations with vegetation. Geomorphic alterations can also directly affect soil properties, such as near-surface texture, and the wetland chemical environment such as the redox state or nutrient composition in the rooting zone. In rating this variable, do not include these resultant effects of geomorphic change; rather focus on the physical impacts within the footprint of the alteration within the AA — For example, the width and depth of a ditch or the size of a levee within the AA would describe the extent of the stressors. The secondary effects of geomorphic change are addressed by other variables. All alterations to geomorphology should be evaluated including small-scale impacts such as pugging, hoof sheer, and sedimentation which can be significant but not immediately obvious.

Scoring Rules:

1. Identify impacts to geomorphological setting and topography within the AA and record them on the stressor checklist. 2.Considering all of the stressors identified, assign an overall variable score using the scoring guidelines.

/		Stressors	Comments
		Dredging/Excavation/Mining	
		Fill, including dikes, road grades, etc.	
		Grading	
	al	Compaction	
	er	Plowing/Disking	
	Gener	Excessive Sedimentation	
	9	Dumping	
		Hoof Shear/Pugging	
		Aggregate or Mineral Mining	
×		Sand Accumulation	From road grit from interchange of I-70 and Havana
		Channel Instability/Over Widening	
	Only	Excessive Bank Erosion	
	ŏ	Channelization	
	SIS	Reconfigured Stream Channels	
	eu (Artificial Banks/Shoreline	
	Channels	Beaver Dam Removal	
	$\ddot{\circ}$	Substrate Embeddedness	
		Lack or Excess of Woody Debris	

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	A Reference Standard	Topography essentially unaltered from the natural state, or alterations appear to have a minimal effect on wetland functioning and condition. Patch or microtopographic complexity may be slightly altered, but native plant communities are still supported.
<0.9 - 0.8	B Highly Functioning	Alterations to topography result in small but detectable changes to habitat conditions in some or all of the AA; or more severe impacts exist but affect less than 10% of the AA.
<0.8 - 0.7	C Functioning	Changes to AA topography may be pervasive but generally mild to moderate in severity. May include patches of more significant habitat alteration; or more severe alterations affect up to 20 % of the AA.
<0.7 - 0.6	D Functioning Impaired	At least one important surface type or landform has been eliminated or created; microtopography has been strongly impacted throughout most or all of the AA; or more severe alterations affect up to 50% of the AA. Evidence that widespread diminishment or alteration of native plant community exist due to physical habitat alterations. Most incidentally created wetland habitat such as that created by roadside ditches and the like would score in this range or lower.
<0.6	F Non- functioning	Pervasive geomorphic alterations have caused a fundamental change in site character and functioning, commonly resulting in a conversion to upland or deepwater habitat.

Variable 6 Score

Variable 7: Water and Soil Chemical Environment

This variable concerns the chemical environment of the soil and water media within the AA, including pollutants, water and soil characteristics. The origin of pollutants may be within or outside the AA. Score this variable by listing indicators of chemical stress in the AA. Consider point source and non-point sources of pollution, as well as mechanical or hydrologic changes that after the chemical environment. Because water quality frequently cannot be inferred directly, the presence of stressors is often identified by the presence of indirect indicators. Five sub-variables are used to describe the Water and Soil Chemical Environment: Nutrient Enrichment/Eutrophication/Oxygen; Sedimentation/Turbidity; Toxic Contamination/pH; Temperature; and Soil Chemistry and Redox Potential. Utilization of web-based data mining tools is highly recommended to help inform and support variable scores.

Scoring rules:

- 1. Stressors are grouped into sub-variables which have a similar signature or set of causes.
- 2. Use the indicator list to identify each stressor impacting the chemical environment of the AA.
- 3. For each sub-variable, determine its score using the scoring guideline table provided on the second page of the scoring sheet. Scoring sub-variables is carried out in exactly the same way as normal variable scoring.
- -If the AA is part of a water body that is recognized as impaired or recommended for TMDL development for one of the factors, then score that sub-variable 0.65 or lower.
- 4. Transcribe sub-variable scores to the following variable scoring page and compute the sum.
- 5. The lowest sub-variable score sets the letter grade range. The composite of sub-variables influences the score within that range.

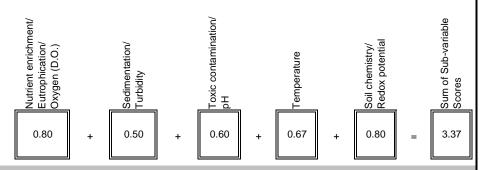
Sub-variable	Stressor Indicator	√	Comments]	Sub-
	Livestock			\mathbb{Z}	variable
SV 7.1	Agricultural Runoff] _	Score
Nutrient Enrichment/	Septic/Sewage				0.80
Eutrophication/	Excessive Algae or Aquatic Veg.			_	0.00
Oxygen (D.O.)	Cumulative Watershed NPS] /	
Oxygen (D.O.)	CDPHE Impairment/TMDL List			1/	
	Excessive Erosion			1	
	Excessive Deposition	Х	Road grit from I-70 & Havana	7\	
	Fine Sediment Plumes			1 \	
SV 7.2	Agricultural Runoff			1 [0.50
Sedimentation/	Excessive Turbidity				0.50
Turbidity	Nearby Construction Site			7 /	
·	Cumulative Watershed NPS			1/	
	CDPHE Impairment/TMDL List			1/	
	Recent Chemical Spills			-{	
	Nearby Industrial Sites	Х	Distribution center uphill to SE	1\	
	Road Drainage/Runoff	^	Distribution center uprilir to 3L	-1\	
	Livestock			┨ \	
	Agricultural Runoff			┨ \	
SV 7.3	Storm Water Runoff			1 1	
Toxic contamination/	Fish/Wildlife Impacts			1 1	0.60
рН	Vegetation Impacts			┨ <i>╠</i>	
P	Cumulative Watershed NPS			1 /	
	Acid Mine Drainage			1/	
	Point Source Discharge			1/	
	CDPHE Impairment/TMDL List			1/	
	Metal staining on rocks and veg.			√	
	Excessive Temperature Regime			┪	
	Lack of Shading	Х	No trees for shade	1 \	
	Reservoir/Power Plant Discharge			1]	
SV 7.4	Industrial Discharge			1	0.67
Temperature	Cumulative Watershed NPS			1 /	
	CDPHE Impairment/TMDL List			1/	
	Unnatural Saturation/Desaturation			K.	
SV 7.5	Mechanical Soil Disturbance	1		┤	
Soil chemistry/	Dumping/introduced Soil	 		1	0.80
Redox potential	CDPHE Impairment/TMDL List			┧╱┸	
	·			Y	

Variable 7: Water and Soil Chemical Environment p.2

Sub-variable Scoring Guidelines

Variable Score	Condition Class	Scoring Guidelines			
1.0 - 0.9 A Reference Standard		Stress indicators not present or trivial.			
<0.9 - 0.8 B Highly Functioning		Stress indicators scarcely present and mild, or otherwise not occurring in more than 10% of the AA.			
<0.8 - 0.7 C Functioning		Stress indicators present at mild to moderate levels, or otherwise not occurring in more than 33% of the AA.			
<0.7 - 0.6		Stress indicators present at moderate to high levels, or otherwise not occurring in more than 66% of the AA			
<0.6		Stress indicators strongly evident throughout the AA at levels which apparently alter the fundamental chemical environment of the wetland system			

Input each sub-variable score from p. 1 of the V7 data form and calculate the sum.



Use the table to score the Chemical Environment Variable circling the applicable scoring rules.

Variable Score	Condition Grade	Scoring Rules				
Score	Orace	Single Factor		Composite Score		
1.0 - 0.9	A Reference Standard	110 09.0 14010. 000.00 1 0.0		The factor scores sum > 4.5		
<0.9 - 0.8	B Highly Functioning	Any single factor scores ≥ 0.8 but < 0.9		The factor scores sum >4.0 but ≤4.5		
<0.8 - 0.7	C Functioning	Any single factor scores ≥ 7.0 but < 0.8		The factor scores sum >3.5 but ≤ 4.0		
<0.7 - 0.6	D Functioning Impaired	Any single factor scores ≥ 0.6 but <0.7		The factor scores sum >3.0 but ≤3.5		
< 0.6	F Non- functioning	Any single factor scores < 0.6		The factor scores sum < 3.0		

Variable 7 Score

Variable 8: Vegetation Structure and Complexity

This variable is a measure of the condition of the wetland's vegetation relative to its native state. It particularly focuses on the wetland's ability to perform higher-order functions such as support of wildlife populations, and influence primary functions such as flood-flow attenuation, channel stabilization and sediment retention. Score this variable by listing stressors that have affected the structure, diversity, composition and cover of each vegetation stratum that would normally be present in the HGM (regional) subclass being assessed. For this variable, stressor severity is a measure of how much each vegetation stratum differs functionally from its natural condition or from the natural range of variability exhibited the HGM subclass or regional subclass. This variable has four sub-variables, each corresponding to a stratum of vegetation: Tree Canopy; Shrub Layer; Herbaceous Layer; and Aquatics.

Rules for Scoring:

- 1. Determine the number and types of vegetation layers present within the AA. Make a judgment as to whether additional layers were historically present using direct evidence such as stumps, root wads or historical photographs. Indirect evidence such as local knowledge and expert opinion can also be used in this determination.
- 2. Do not score vegetation layers that would not normally be present in the wetland type being assessed.
- 3. Estimate and record the current coverage of each vegetation layer at the top of the table.
- 4. Record the Reference Standard or expected percent coverage of each vegetation layer to create the sub-variable weighting factor. The condition of predominant vegetation layers has a greater influence on the variable score than do minor components.
- 5. Enter the percent cover values as decimals in the row of the stressor table labeled "Reference/expected Percent Cover of Layer". Note, percentages will often sum to more than 100% (1.0).
- 6. Determine the severity of stressors acting on each individual canopy layers, indicating their presence with checks in the appropriate boxes of the stressor table. The difference between the expected and observed stratum coverages is one measure of stratum alteration.
- 7. Determine the sub-variable score for each valid vegetation layer using the scoring guidelines on the second page of the scoring sheet. Enter each sub-variable score in the appropriate cell of the row labeled "Veg. Layer Sub-variable Score". If a stratum has been wholly removed score it as 0.5.
- 8. Multiply each layer's *Reference Percent Cover of Layer* score by its Veg. Layer Sub-variable scores and enter the products in the labled cells. These are the weighted sub-variable scores. Individually sum the *Reference Percent Cover of Layer* and *Weighted Sub-variables scores*.
- 9. Divide the sum of "Veg. Layer Sub-variable Scores" by the total coverage of all layers scored. This product is the Variable 8 score. Enter this number in the labeled box at the bottom of this page.

	١	/egetatio	n Layers		
Current % Coverage of					
Layer			х		
Stressor	Tree	Shrub	Herb	Aquatic	Comments
Noxious Weeds					
Exotic/Invasive spp.					
Tree Harvest					
Brush Cutting/Shrub Removal					
Livestock Grazing					
Excessive Herbivory					
Mowing/Haying			Х		wetland has been mowed recently
Herbicide					
Loss of Zonation/Homogenization					
Dewatering					
Over Saturation					
DIFFERENCE BETWEEN CURRENT COVERAGE AND REFERENCE/EXPECTED			0		
Reference/Expected % Cover of Layer	+ X	+ X	1.00 +	. X	= 1
Veg. Layer Sub- variable Score			0.63		See sub-variable scoring guidelines on following page
	II	II	II	II	
Weighted Sub-variable Score	+	+	0.63 +		= 0.63
					Variable 8 Score 0.63

Variable 8: Vegetation Structure and Complexity p. 2

Sub-variable 8 Scoring Guidelines:
Based on the list of stressors identified above, rate the severity of their cumulative effect on vegetation structure and complexity for each vegetation layer.

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	A Reference Standard	Stressors not present or with an intensity low enough as to not detectably affect the structure, diversity or composition of the vegetation layer.
<0.9 - 0.8	B Highly Functioning	Stressors present at intensity levels sufficient to cause detectable, but minor, changes in layer composition. Stress related change should generally be less than 10% for any given attribute (e.g., 10% cover of invasive, 10% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as high as 33% for a given attribute if stressors are confined to patches comprising less than 10% of the wetland.
<0.8 - 0.7	C Functioning	Stressors present with enough intensity to cause significant changes in the character of vegetation, including alteration of layer coverage, structural complexity and species composition. The vegetation layer retains its essential character though. AA's with a high proportion of non-native grasses will commonly fall in this class. Stress related change should generally be less than 33% for any given attribute (e.g., 33% cover of invasive, 33% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as much as 66% for a given attribute if stressors are confined to patches comprising less than 25% of the wetland.
<0.7 - 0.6	D Functioning Impaired	Stressor intensity severe enough to cause profound changes to the fundamental character of the vegetation layer. Stress-related change should generally be less than 66% for any given attribute (e.g., 66% cover of invasive, 66% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as much as 80% of a given attribute if stressors are confined to patches comprising less than 50% of the wetland.
<0.6	F Non- functioning	Vegetation layer has been completely removed or altered to the extent that is no longer comparable to the natural structure, diversity and composition.

FACWet Score Card

Scoring Procedure:

- 1. Transcribe variable scores from each variable data sheet to the corresponding cell in the variable score table.
- 2. In each Functional Capacity Index (FCI) equation, enter the corresponding variable scores in the equation cells. Do not enter values in the crossed cells lacking labels.
- 3. Add the variable scores to calculate the total functional points achieved for each function.
- 4. Divide the total functional points achieved by the functional points possible. The typical number of total points possible is provided, however, if a variable is added or subtracted to FCI equation the total possible points must be adjusted.
- 5. Calculate the Composite FCI, by adding the FCI scores and dividing by the total number of functions scored (usually 7).
- 6. If scoring is done directly in the Excel spreadsheet, all values will be transferred and calculated automatically.

VARIA	BLE SCORE	TABLE		
Buffer & Landscape Context	Variable 1:	Habitat Connectivity (Connect)	0.58	
Buffi Lands Con	Variable 2:	Contributing Area (CA)	0.30	
λ£	Variable 3:	Water Source (Source)	0.75	
Hydrology	Variable 4:	Water Distribution (Dist)	0.75	
Í	Variable 5:	Water Outflow (Outflow)	0.73	
Biotic	Variable 6:	Geomorphology (Geom)	0.80	
Abiotic and Biotic Habitat	Variable 7:	Chemical Environment (Chem)	0.68	
Abioti	Variable 8:	Vegetation Structure and Complexity (Veg)	0.63	
Function	al Capacity	Indices		
Function 1 -	Support of Cha	Total Functional		FCI
V1 _{connect}	+ V2 _{CA} +	(2 x V8 _{veg}) Points		. 0.
0.58	+ 0.30 +	1.26 + + + = 2.14	÷ 4 =	0.54
Function 2 -	Support of Cha	racteristic Fish/aquatic Habitat		•
(3 x V3 _{source})	+ (2 x V4 _{dist}) +	(2 x V5 _{outflow}) + V6 _{geom} + V7 _{chem}		
2.25	+ 1.50 +	1.46 + 0.80 + 0.68 + = 6.69	÷ 9 =	0.74
	Flood Attenuat			
V2 _{CA}	+ (2 x V3 _{source}) +	(2 x V4 _{dist}) + (2 x V5 _{outflow}) + V6 _{geom} + V8 _{veg}		
0.30	+ 1.50 +	1.50 + 1.46 + 0.80 + 0.63 = 6.19	÷ 9 =	0.69
		g-term Water Storage		
V3 _{source}	+ (2 x V4 _{dist}) +	(2 x V5 _{outflow}) V6 _{geom}	ı Ti	
0.75	+ 1.50 +	1.46 + 0.80 + = 4.51	÷ 6 =	0.75
Function 5 -	Nutrient/Toxica	ant Removal		
(2 x V2 _{CA})	+ (2 x V4 _{dist}) +	V6 _{geom} V7 _{chem}	_	
0.60	+ 1.50 +	0.80 + 0.68 + + = 3.58	÷ 6 =	0.60
Function 6 -	Sediment Rete	ntion/Shoreline Stabilization		<u> </u>
V2 _{CA}	+ (2 x V6 _{geom}) +	(2 x V8 _{veg})		
0.30	+ 1.60 +	1.26 + + + = 3.16	÷ 5 =	0.63
Function 7 -	Production Ex	port/Food Chain Support		
V1 _{connect}	+ (2 x V5 _{outflow}) +	V6 _{geom} + V7 _{chem} + (2 x V8 _{veg})		
0.58	+ 1.46 +	0.80 + 0.68 + 1.26 + = 4.78	÷ 7 =	0.68
-		Sum of Individual FCI	Scores	4.63
		Divide by the Number of Function	ons Scored	÷ 7

ide by the Number of Functions Scored ÷

0.66

Composite FCI Score

ADMINISTRATIVE CHARACTERIZATION

					_							
General Informat	ion		_		_	Date of Evaluation:	7/30/2013	3				
Site Name or ID:	WL-2	' 				Project Name:	I-70 Bridg	ge over Hava	na Street			
404 or Other Permit Application #:						Applicant Name:	CDOT					
Evaluator Name(s):	Elly Weber	Elly Weber				essional position and organization:	Biologist, Pinyon Environmental					
Location Informa	ation:											
Site Coordinates (Decimal Degrees, e.g., 38.85, -104.96):		74947°, -104	1.86	63140°		Geographic Datum Used (NAD 83):	NAD 83					
30.03, -10 4 .30 <i>j</i> .	l					Elevation		5293				
Location Information:	Just outside in	terchange o	f H	avana Street	and	d I-70, southeast	quadrant					
Associated stream/waname:	iter body			N/A			Stream C)rder:	N/A			
USGS Quadrangle Map:	Montbello	Map Scale: (Circle one)				х	1:24,000 Other	1:100,000 1:				
Sub basin Name (8 digit HUC):	10190003		Wetland Ownership:				CDOT					
Project Informati	on:				Х	Potentially Impa	cted Wetla	ands				
This evaluation is being performed at: (Check applicable box)	x Project We Mitigation S	(CHECK all			-construction							
Intent of Project: (Che	ck all applicable)	-		Restoration		Enl	hancement		Creation			
Total Size of Wetland (Record Area, Check and I Measurement Method Use	Describe	0.0438 ac.	х	Measured Estimated	_							
Assessment Area (AA Area, check appropriate box.		0.0438 ac.	х	Measured		ac.	ac.	ac.	ac.			
used to record acreage when n included in a single assessmen	nore than one AA is	0.0430 au.		Estimated		ac.	ac.	ac.	ac.			
Characteristics or Med AA boundary determin		The AA boundary is the boundary of the wetland located wholly within the AOI.										
Notes: WL-2 is	s in a roadside (ditch, east o	f H	avana Street,	so	outh of I-70.						

ECOLOGICAL DESCRIPTION 1

Spe	ecial Cor	ncerns	Check all that apply						
	J	s including Histosols or le AA (i.e., AA includes o			-	eatened or endangered to occur in the AA?	species are		
	,	lirectly impact organic seas possessing either Hi	•						
		s are known to occur an vetland of which the AA			•	oncern according to the IHP) are known to occur			
	The wetland urbanized la	is a habitat oasis in an ndscape?	otherwise dry or	The site is located within a potential conservation ar or element occurrence buffer area as determined by CNHP?					
		eatened or endangered AA? List Below.	species are KNOWN to		Other specia	I concerns (please desc	ribe)		
Ì									
		-	YDROGEOMOR	PHI	C SETTIN	NG.			
$\overline{}$	A A westlemed								
	AA wetland	has been subject to ch	ntal natural hydrogeomo nange in HGM classes a	s a re	sult of anthro	ppogenic modification			
	If the above	is checked, please de	escribe the original wetla	nd ty	oe if discerna	ble using the table bel	ow.		
Ш	AA wetland	was created from an u	•						
Cui	rent Cor	nditions	Describe the hydrogeor that apply.	morph	nic setting of t	the wetland by circling	all conditions		
		Water source	Surface flow	G	Groundwater	Precipitation	Unknown		
		Hydrodynamics	Inidirectional		Vertical	Bi-directional			
		Wetland Gradient	(-2%	<u>) </u>	2-4%	4-10% >10%			
		# Surface Inlets	Over-bank	0	$\overline{}$	2 3	>3		
HGM	Setting	# Surface Outlets Geomorphic Setting (Narrative Description. Include approx. stream order for riverine)	This wetland is a depre		al wetland for	-	3 .h.		
		HGM class	Riverine		Slope	Depressional	Lacustrine		
Hist	orical Cor	nditions							
		Water source	Surface flow	G	Groundwater	Precipitation	Unknown		
		Hydrodynamics	Inidirectional		Vertical				
	Previous and typology	Geomorphic Setting (Narrative Description)	This wetland has presu	<u>m</u> ably	not changed	d since its formation.			
		Previous HGM Class	Riverine		Slope	Depressional	Lacustrine		
Note	s (include inf	ormation on the AA's I	HGM subclass and regic	onal si	ubclass):				

ECOLOGICAL DESCRIPTION 2

System	Q.	heve	tom		Clas	c		Sı	ıbcla	SS			\/\/a+	er Re	aima		Oth	ner M	1odifi	ers	% /	ΔΛ
Palustrine		Subsystem Palustrine			EM		F	Roote			ar		vvalt	E	gime	,	Oti	ici iv	iodili	CIS		00
Palustrine	Pr	alustr	ine		EM			KOOLE	ed va	SCUIA	ar .			E								<u></u>
acustrine alustrine iverine	Uppe			Unco Aqua Rock Unco Em Shru	ck Bot. n Botto atic Be ky Shor on Shor nergent ub-scru rested	e(US) re(US) (EM) b(SS)		Roote Algal Non- oad-lea edle-le Cobl Sa		cular; stent; tent; eciduoi vergre avel; ud;		Examples Temporarily flooded(A); Saturated(B); Seasonally flooded(C); Seasflood./sat.(E); Semi-Pern. flooded(F); Intermittently exposed(G); Artificially flooded(K); Sat./semipern./Seas. (Y); Int. exposed/permenant(Z)); ⁻); G); ; Y);	Hypersaline(7); Eusaline(8); Mixosaline(9); Fresh(0); Acid(a); Circumneutral(c); Alkaline/calcareous(i); Organic(g); Mineral(n); Beaver(b); Partially Drained/ditched(d); Farmed(f); Diked/impounded(h); Artificial Substrate(r); Spoil(s); Excavated(x)							
Site Map cale: 1 sq. =						ap of to ant fea			ding r	elevai	nt port	ions d	of the	wetlar	nd, AA	boun	dary,	struct	ures, i	habita	t class	ses
See Figure	3																					
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Variable 1: Habitat Connectivity

The Habitat Connectivity Variable is described by two sub-variables – Neighboring Wetland and Riparian Habitat Loss and Barriers to Migration and Dispersal. These sub-variables were treated as independent variables in FACWet Version 2.0. The merging of these variables makes their structure more consistent with that of other composite variables in FACWet. The new variable configuration also makes this landscape variable more accurately reflect the interactions amongst aquatic habitats in Colorado's agricultural and urbanized landscapes, which have a naturally low density of wetlands. The two Habitat Connectivity Sub-variables are scored in exactly the same manner as their FACWet 2.0 counterparts, as described below. The Habitat Connectivity Variable score is simply the arithmetic average of the two sub-variable scores which is entered on the second page of the Variable 1.1 is not scored.

SV 1.1 - Neighboring Wetland and Riparian Habitat Loss

(Do not score if few or no wetlands naturally exist in the HCE)

This sub-variable is a measure of how isolated from other naturally-occurring wetlands or riparian habitat the AA has become as the result of habitat destruction. To score this sub-variable, estimate the percent of naturally-occurring wetland/riparian habitat that has been lost (by filling, draining, development, or whatever means) within the 500-meter-wide belt surrounding the AA. This zone is called the Habitat Connectivity Envelope (HCE). In most cases the evaluator must use best professional judgment to estimate the amount of natural wetland loss. Historical photographs, National Wetland Inventory (NWI) maps, hydric soil maps can be helpful in making these determinations. Floodplain maps are especially valuable in river-dominated regions, such as the Front Range urban corridor. Evaluation of landforms and habitat patterns in the context of perceivable land use change is used to steer estimates of the amount of wetland loss within the HCE.

Rules for Scoring:

- 1. On the aerial photo, create a 500 m perimeter around the AA.
- 2. The area within this perimeter is the Habitat Connectivity Envelope (HCE).
- 3. Within the HCE, outline the current extent of naturally occurring wetland and riparian habitat. Do not include habitats such as excavated ponds or reservoir induced fringe wetlands.
- 4. Outline the historical extent of wetland and riparian habitats (i.e., existing natural wetlands plus those that have been destroyed).
- Use your knowledge of the history of the area and evident land use change to identify where habitat losses have occurred. Additional research can be utilized to increase the accuracy of this estimate including consideration of floodplain maps, historical aerial photographs, soil maps, etc.
- 5. Calculate the area of existing and historical wetlands. Divide the area of existing wetland by the total amount of existing and historical wetland and riparian habitat, and determine the variable score using the guidelines below. Enter sub-variable score at the bottom of p.2 of the Habitat Connectivity data form.

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	A Reference Standard	Wetland losses are absent or negligible or there is no evidence to suggest the native landscape within the HCE historically contained other wetland habitats
<0.9 - 0.8	B Highly Functioning	More than 80% of historical wetland habitat area within the HCE is still present (less than 20% of habitat area lost).
<0.8 - 0.7	C Functioning	80 to 60% of historical wetland habitat area within the HCE is still present (20% to 40% of habitat area lost).
<0.7 - 0.6	D Functioning Impaired	Less than 60 to 25% of historical wetland habitat area within the HCE is still present (more than 40 to 75% of habitat area lost).
<0.6	F Non- functioning	Less than 25% of the historical wetland habitat area within the HCE still in existence (more than 70% of habitat lost).

	mpanea	
<0.6		Less than 25% of the historical wetland habitat area within the HCE still in existence (more than 70% of habitat lost).
Notes:		

Variable 1: Habitat Connectivity p. 2

SV 1.2: Migration/Dispersal Barriers

This sub-variable is intended to rate the degree to which the AA has become isolated from existing neighboring wetland and riparian habitat by artificial barriers that inhibit migration or dispersal of organisms. On the aerial photograph, identify the man-made barriers within the HCE that intercede between the AA and surrounding wetlands and riparian areas, and identify them by type on the stressor list. Score this variable based on the barriers' impermeability to migration and dispersal and the amount of surrounding wetland/riparian habitat they affect.

Rules for Scoring:

- 1. On the aerial photo, outline all existing wetland and riparian habitat areas within the HCE. This includes naturally occurring habitats, as well as those purposefully created or induced by land use change.
- 2. Identify artificial barriers to dispersal and migration of organisms within the HCE that intercede between the AA and surrounding habitats. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.
- 3. Considering the composite effect of all of identified barriers to migration and dispersal (i.e., stressors), assign an overall variable score using the scoring guidelines.

	√	Stressors	Comments/description
,,	х	Major Highway	I-70
barriers		Secondary Highway	
ari	х	Tertiary Roadway	Havana Street
q	Х	Railroad	Railroad spur on the west side of Havana Street, and to the SE
S.		Bike Path	
artificial	Х	Urban Development	Commercial, and light industrial area in Denver Metro Area
a B		Agricultural Development	
		Artificial Water Body	
Sor		Fence	
Stressors	х	Ditch or Aqueduct	Concrete-lined ditch in northeast portion of study area
Str		Aquatic Organism Barriers	
1			

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	A Reference Standard	No appreciable barriers exist between the AA and other wetland and riparian habitats in the HCE; or there are no other wetland and riparian areas in the HCE.
<0.9 - 0.8	B Highly Functioning	Barriers impeding migration/dispersal between the AA and up to 33% of surrounding wetland/riparian habitat highly permeable and easily passed by most organisms. Examples could include gravel roads, minor levees, ditches or barbed-wire fences. More significant barriers (see "functioning category below) could affect migration to up to 10% of surrounding wetland/riparian habitat.
<0.8 - 0.7	C Functioning	Barriers to migration and dispersal retard the ability of many organisms/propagules to pass between the AA and up to 66% of wetland/riparian habitat. Passage of organisms and propagules through such barriers is still possible, but it may be constrained to certain times of day, be slow, dangerous or require additional travel. Busy two-lane roads, culverted areas, small to medium artificial water bodies or small earthen dams would commonly rate a score in this range. More significant barriers (see "functioning impaired" category below) could affect migration to up to 10% of surrounding wetland/riparian habitat.
<0.7 - 0.6	D Functioning Impaired	Barriers to migration and dispersal preclude the passage of some types of organisms/propagules between the AA and up to 66% of surrounding wetland/riparian habitat. Travel of those animals which can potential negotiate the barrier are strongly restricted and may include a high chance of mortality. Up to 33% of surrounding wetland/riparian habitat could be functionally isolated from the AA.
<0.6	F Non-functioning	AA is essentially isolated from surrounding wetland/riparian habitat by impermeable migration and dispersal barriers. An interstate highway or concrete-lined water conveyance canal are examples of barriers which would generally create functional isolation between the AA and wetland/riparian habitat in the HCE.

SV 1.1 Score		Add SV 1.1 and 1.2 scores and divide by
SV 1.2 Score	0.58	two to calculate variable score

Variable 1 Score

Variable 2: Contributing Area

The AA's Contributing Area is defined as the 250-meter-wide zone surrounding the perimeter of the AA. This variable is a measure of the capacity of that area to support characteristic functions of high quality wetland habitat. Depending on its condition, the contributing area can help maintain wetland condition or it can degrade it. Contributing Area condition is evaluated by considering the AA's Buffer and its Surrounding Land Use. Buffers are strips or patches of more-or-less natural upland and/or wetland habitat more than 5m wide. Buffers are contiquous with the AA boundary and they intercede between it and more intensively used lands. The AA Buffer is characterized with three sub-variables: Buffer Condition, Buffer Extent, and Average Buffer Width. The Surrounding Land Use Sub-variable considers changes within the Contributing Area that limit its capacity to support characteristic wetland functions. Many of the acute, on-site effects of land use change in the Contributing Area are specifically captured by Variables 3 - 8.

Rules for Scoring:

- 1. Delimit the Contributing Area on an aerial photograph as the zone within 250 meters of the outer boundary of the AA.
- 2. Evaluate and then rate the Buffer Condition sub-variable using the scoring guidelines. Record the score in the cell provided
- 3. Indicate on the aerial photograph zones surrounding the AA which have ≥5m of buffer vegetation and those which do not.
- 4. Calculate the percentage of the AA which has a Buffer and record the value where indicated on the data sheet.
- 5. Rate the Buffer Extent Sub-variable using the scoring guidelines.
- 6.Determine the average Buffer width by drawing a line perpendicularly from the AA boundary to the outer extent of the buffer habitat. Measure line length and record its value on the data sheet. Repeat this process until a total of 8 lines have been sampled.
- 7. Calculate the average buffer width and record value on the data form. Then determine the sub-variable score using the scoring guidelines.
- 8.Score the Surrounding Land Use sub-variable by recording land use changes on the stressor list that affect the capacity of the landscape to support characteristic wetland functioning.
- 9. Enter the lowest of the three Buffer sub-variable scores along with the Surrounding Land Use Sub-variable score in the Contributing Area Variable scoring formula at the bottom of p. 2 of the data form. The Contributing Area Variable is the average of the two sub-variable scores.

SV 2.1 - Buffer Condition

0.57 SV 2.1 - Buffer Condition Score

Subvariable Score	Condition Grade	Buffer Condition Scoring Guidelines
1.0 - 0.9	Reference Standard	Buffer vegetation is predominately native vegetation, human-caused disturbance of the substrate is not evident, and human visitation is minimal. Common examples: Wilderness areas, undeveloped forest and range lands.
<0.9 - 0.8	Highly Functioning	Buffer vegetation may have a mixed native-nonnative composition, but characteristic structure and complexity remain. Soils are mostly undisturbed or have recovered from past human disturbance. Little or only low-impact human visitation. Buffers with higher levels of substrate disturbance may be included here if the buffer is still able to maintain predominately native vegetation. Common examples: Dispursed camping areas in national forests, common in wildland parks (e.g. State Parks) and open spaces.
<0.8 - 0.7	Functioning	Buffer vegetation is substantially composed of non-native species. Vegetation structure may be somewhat altered, such as by brush clearing. Moderate substrate distrbance and compaction occurs, and small pockets of greater disturbance may exist. Common examples: City natural areas, mountain hay meadows.
<0.7 - 0.6	Functioning Impaired	Buffer vegetation is substantially composed of non-native species and vegetation structure has been strongly altered by the complete removal of one or more strata. Soil disturbance and the intensity of human visitation are generally high. Common examples: Open lands around resource extraction sites (e.g., gravel mines), clear cut logging areas, ski slopes.
<0.6	Non-functioning	Buffer is nearly or entirely absent.

SV 2.2 - Buffer Extent

0.00 Percent of AA with Buffer

0.55 SV 2.2 - Buffer Extent

Subvariable Score	Condition Class	% Buffer Scoring Guidelines	
1.0 - 0.9	Reference Standard	90 - 100% of AA with Buffer	
<0.9 - 0.8	Highly Functioning	70-90% of AA with Buffer	
<0.8 - 0.7	Functioning	51-69% of AA with Buffer	
<0.7 - 0.6	Functioning Impaired	26-50% of AA with Buffer	
<0.6	Non-functioning	0-25% of AA with Buffer	

	Variable 2: Contributing Area (p. 2)										
					Area	(p. 2)					
SV 2.	3 - <i>F</i>	verage l	Buffer W	/idth		Record r	neasu	red buffer	widths in t	he space	s below and average.
Buffer		0	0	0					_		
Width	` '	1	2	3	4	<u>0</u> 5	<i>0</i>	7	<i>0</i>	Avg. Bu	 uffer Width (m)
		·	_			Subvaria		Condition	Grade		Nidth Scoring Guidelines
	1	SV 2.3	- Avera	ae Bu	ffer	1.0 - 0	-	Reference S	Standard	Average	Buffer width is 190-250m
0.1			idth S	_		<0.9 - 0	0.8	Highly Fun	ctioning	Average	Buffer width is 101-189m
	•					<0.8 - 0).7	Functio	ning	Average	e Buffer width is 31-100m
						<0.7 - 0		Functioning	Impaired		ge Buffer width is 6-30m
						<0.6		Non-func	tioning	Avera	age Buffer width is 0-5m
SV 2.	4 - 8	Surround	ling Lan	d Use							
					1						
0.5	31	/ 2.4 - S Land U				Catalog a			land use	changes i	in the surrounding
		Stresso	rs		Comme	ents/des	cripti	on			
	Х	Industria	al/comme	ercial	Hotels,	restaura	nts, li	ght-indust	rial, inclu	ding CD	OT maintenance facilit
es	х	Urban			High De	ensity dev	velopi	ment in De	enver an	d Comm	erce City
ang		Residen	tial								
Ch		Rural	Forming								
se			Farming e Agricul								
дP			ls or Nurs								
= Land Use Changes			k Grazin			-					
П	Х	Transpo	rtation C	orridor	Intersta	te 70 and	d Hav	ana interc	hange		
ors			arklands								
Stressors		Dams/impoundments									
Str		Artificial Water body Physical Resource Extraction									
			Resource E								
		Biological	1100001001	2/11/40/1011							
Varia Sco		Conditio	on Grade				9	Scoring G	uideline	es	
1.0 -	0.9	Reference	4 e Standard	No appre	ciable land	use chang	e has t	een impose	d Surround	ling Landso	cape.
<0.9	- 0.8		B unctioning	effect on t land use i	the the land is not intens	dscape's ca sive, for ex	apacity ample	to support cl haying, light	haracteristi grazing, or	c aquatic for low intens	t changes have minimal unctioning, either because ity silviculture, or more
-		3 7 1						iected to a n			se, however, the land retains
<0.8	- 0.7		C tioning	much of it sediment.	ts capacity . Moderate	to support e-intensity la	natural and use	wetland fun	ction and it ry-land farr	is not an o	overt source of pollutants or n "green" corridors, or
<0.7	- 0.6	Funct	D tioning aired	to high co considera has been urban dev	use changes within the Surrounding Landscape has been substantial including the a moderate in coverage (up to 50%) of impermeable surfaces, bare soil, or other artificial surfaces; derable in-flow urban runoff or fertilizer-rich waters common. Supportive capacity of the land seen greatly diminished but not totally extinguished. Intensively logged areas, low-density developments, some urban parklands and many cropping situations would commonly rate a within this range.					er artificial surfaces; cortive capacity of the land ged areas, low-density	
<0.6 F Non-functioning The Surrounding Landscape is essentially comletely developed or is otherwise a cause of seve ecological stress on wetland habitats. Commercial developments or highly urban landscapes generally rate a score of less than 0.6.											
		Buffer So			unding d Use						
	(0.1	+	0.5) ÷	2		= Vari	iable 2	2 Scor	re 0.30
			I		4						<u> </u>

Variable 3: Water Source

This variable is concerned with **up-gradient** hydrologic connectivity. It is a measure of impacts to the AA's water source, including the quantity and timing of water delivery, and the ability of source water to perform work such as sediment transport, erosion, soil pore flushing, etc. To score this variable, identify stressors that alter the source of water to the AA, and record their presence on the stressor list. Stressors can impact water source by depletion, augmentation, or alteration of inflow timing or hydrodynamics. This variable is designed to assess water quantity, power and timing, not water quality. Water quality will be evaluated in Variable 7.

Scoring rules:

- 1. Use the stressor list and knowledge of the watershed to catalog type-specific impairments of the AA's water source. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.
- 2. Considering the composite effect of stressors on the water source, rate the condition of this variable with the aid of the scoring guidelines.

√	Stressors	Comments/description
	Ditches or Drains (tile, etc.)	
	Dams	
	Diversions	
	Groundwater pumping	
	Draw-downs	
×	Culverts or Constrictions	Culvert flowing from unknown source contributes to hydrology.
	Point Source (urban, ind., ag.)	
	Non-point Source	
	Increased Drainage Area	
	Storm Drain/Urban Runoff	
×	Impermeable Surface Runoff	I-70 interchange and surrounding commercial and industrial area
	Irrigation Return Flows	
	Mining/Natural Gas Extraction	
	Transbasin Diversion	
	Actively Managed Hydrology	

Variable Score	Condition Grade	Depletion	Augmentation
1.0 - 0.9	A Reference Standard	Unnatural drawdown events minor, rare or non- existent, very slight uniform depletion, or trivial alteration of hydrodynamics.	Unnatural high-water events minor, rare or non- existent, slight uniform increase in amount of inflow, or trivial alteration of hydrodynamics.
<0.9 - 0.8	B Highly Functioning	Unnatural drawdown events occasional, short duration and/or mild; or uniform depletion up to 20%; or mild to moderate reduction of peak flows or capacity of water to perform work.	Occasional unnatural high-water events, short in duration and/or mild in intensity; or uniform augmentation up to 20%; or mild to moderate increase of peak flows or capacity of water to perform work.
<0.8 - 0.7	C Functioning	Unnatural drawdown events common and of mild to moderate intensity and/or duration; or uniform depletion up to 50%; or moderate to substantial reduction of peak flows or capacity of water to perform work.	Common occurrence of unnatural high-water events, of a mild to moderate intensity and/or duration; or uniform augmentation up to 50%; or moderate to substantial increase of peak flows or capacity of water to perform work.
<0.7 - 0.6	D Functioning Impaired	Unnatural drawdown events occur frequently with a moderate to high intensity and/or duration; or uniform depletion up to 75%; or substantial reduction of peak flows or capacity of water to perform work. Wetlands with actively managed or wholly artificial hydrology will usually score in this range or lower.	Common occurrence of unnatural high-water events, some of which may be severe in nature or exist for a substantial portion of the growing season; or uniform augmentation more than 50% or capacity of water to perform work. Wetlands with actively managed or wholly artificial hydrology will usually score in this range or lower.
<0.6	F Non- functioning	Water source diminished enough to threaten or extinguish wetland hydrology in the AA.	Frequency, duration or magnitude of unnaturally high-water great enough to change the fundamental characteristics of the wetland.

Variable 3 Score

Variable 4: Water Distribution

This variable is concerned with hydrologic connectivity within the AA. It is a measure of alteration to the spatial distribution of surface and groundwater within the AA. These alterations are manifested as local changes to the hydrograph and generally result from geomorphic modifications within the AA. To score this variable, identify stressors within the AA that alter flow patterns and impact the hydrograph of the AA, including localized increases or decreases to the depth or duration of the water table or surface water.

Because the wetland's ability to distribute water in a characteristic fashion is fundamentally dependent on the condition of its water source, in most cases the Water Source variable score will define the upper limit Water Distribution score. For example, if the Water Source variable is rated at 0.85, the Water Distribution score will usually have the potential to attain a maximum score of 0.85. Additional stressors within or outside the lower end of the AA effecting water distribution (e.g., ditches and levees) will reduce the score from the maximum value.

Scoring rules:

- 1. Identify impacts to the natural distribution of water throughout the AA and catalog them in the stressor table.
- 2. Considering all of the stressors identified, assign an overall variable score using the scoring guidelines. In most cases, the Water Source variable score will set the upper limit for the Water Distribution score.

✓	Stressors	Comments/description
×	Alteration of Water Source	See variable 3: water source
	Ditches	
	Ponding/Impoundment	
	Culverts	
	Road Grades	
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Enlarged Channel	
	Artificial Banks/Shoreline	
	Weirs	
	Dikes/Levees/Berms	
	Diversions	
	Sediment/Fill Accumulation	

Variable Score	Condition Grade	Non-riverine	Riverine
1.0 - 0.9		Little or no alteration has been made to the way in which water is distributed throughout the wetland. AA maintains a natural hydrologic regime.	Natural active floodplain areas flood on a normal recurrence interval. No evidence of alteration of flooding and subirrigation duration and intensity.
<0.9 - 0.8	B Highly Functioning	Less than 10% of the AA is affected by in situ hydrologic alteration; or more widespread impacts result in less than a 2 in. (5 cm) change in mean growing season water table elevation.	Channel-adjacent areas have occasional unnatural periods of drying or flooding; or uniform shift in the hydrograph less than typical root depth.
<0.8 - 0.7	C Functioning	Between 10 and 33% of the AA is affected by in situ hydrologic alteration; or more widespread impacts result in a 4 in. (5 cm) or less change in mean growing season water table elevation.	In channel-adjacent area, periods of drying or flooding are common; or uniform shift in the hydrograph near root depth.
<0.7 - 0.6	D Functioning Impaired	33 to 66% of the AA is affected by in situ hydrologic alteration; or more widespread impacts result in a 6 in. (15 cm) or less change in mean growing season water table elevation. Water table behavior must still meet jurisdictional criteria to merit this rating.	Adjacent to the channel, unnatural periods of drying or flooding are the norm; or uniform shift in the hydrograph greater than root depth.
<0.6	F Non-functioning	More than 66% of the AA is affected by hydrologic alteration which changes the fundamental functioning of the wetland system, generally exhibited as a conversion to upland or deep water habitat.	Historical active floodplain areas are almost never wetted from overbank flooding, and/or groundwater infiltration is effectively cut off.

Variable 4 Score

Variable 5: Water Outflow

This variable is concerned with down-gradient hydrologic connectivity and the flow of water and water-borne materials and energy out of the AA. In particular it illustrates the degree to which the AA can support the functioning of down-gradient habitats. It is a measure of impacts that affect the hydrologic outflow of water including the passage of water through its normal low- and high-flow surface outlets, infiltration/groundwater recharge, and the energetic characteristics of water delivered to dependent habitats. In some cases, alteration of evapotranspiration rates may be significant enough of a factor to consider in scoring. Score this variable by identifying stressors that impact the means by which water is exported from the AA. To evaluate this variable focus on how water, energy and associated materials are exported out of the AA and their ability it support down-gradient habitats in a manner consistent with their HGM (regional) subclass.

Because the wetland's ability to export water and materials in a characteristic fashion is to a very large degree dependent the condition of its water source, as with the Water Distribution variable, in most cases the Water Source variable score will define the upper limit Water Outflow score.

Scoring rules:

- 1. Identify impacts to the natural outflow of water from the AA and catalog them in the stressor table.
- 2.Considering all of the stressors identified, assign an overall variable score using the scoring guidelines. Take in to account the cumulative effect of stressors on the wetland's ability to export water and water-borne materials. In most cases the Water Source variable will set the upper limit for the Water Outflow score.

/	Stressors	Comments/description
×	Alteration of Water Source	See variable 3: water source
	Ditches	
	Dikes/Levees	
	Road Grades	
	Culverts	
	Diversions	
	Constrictions	
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Artificial Stream Banks	
	Weirs	
	Confined Bridge Openings	

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	A Reference Standard	Stressors have little to no effect on the magnitude, timing or hydrodynamics of the AA water outflow regime.
<0.9 - 0.8	B Highly Functioning	High- or low-water outflows are mildly to moderately affected, but at intermediate ("normal") levels flow continues essentially unaltered in quantity or character.
<0.8 - 0.7	C Functioning	High- or low-water outflows are moderately affected, mild alteration of intermediate level outflow occurs; or hydrodynamics moderately affected.
<0.7 - 0.6	D Functioning Impaired	Outflow at all stages is moderately to highly impaired resulting in persistent flooding of portions of the AA or unnatural drainage; or outflow hydrodynamics severely disrupted.
<0.6	F Non-functioning	The natural outflow regime is profoundly impaired. Down-gradient hydrologic connection severed or nearly so. Alterations may cause widespread unnatural persistent flooding or dewatering of the wetland system.

Variable 5 Score

Variable 6: Geomorphology

This variable is a measure of the degree to which the geomorphic setting has been altered within the AA. Changes to the surface configuration and natural topography constitute stressors. Such stressors may be observed in the form of fill, excavation, dikes, sedimentation due to absence of flushing floods, etc. In riverine systems, geomorphic changes to the stream channel should be considered if the channel is within the AA (i.e, small is size). Alterations may involve the bed and bank (substrate embeddedness or morphological changes), stream instability, and stream channel reconfiguration. Geomorphic changes are usually ultimately manifested as changes to wetland surface hydrology and water relations with vegetation. Geomorphic alterations can also directly affect soil properties, such as near-surface texture, and the wetland chemical environment such as the redox state or nutrient composition in the rooting zone. In rating this variable, do not include these resultant effects of geomorphic change; rather focus on the physical impacts within the footprint of the alteration within the AA — For example, the width and depth of a ditch or the size of a levee within the AA would describe the extent of the stressors. The secondary effects of geomorphic change are addressed by other variables. All alterations to geomorphology should be evaluated including small-scale impacts such as pugging, hoof sheer, and sedimentation which can be significant but not immediately obvious.

Scoring Rules:

1. Identify impacts to geomorphological setting and topography within the AA and record them on the stressor checklist. 2.Considering all of the stressors identified, assign an overall variable score using the scoring guidelines.

/	Stressors		Comments
		Dredging/Excavation/Mining	
		Fill, including dikes, road grades, etc.	
		Grading	
	al	Compaction	
	er	Plowing/Disking	
	Gener	Excessive Sedimentation	
	9	Dumping	
		Hoof Shear/Pugging	
		Aggregate or Mineral Mining	
		Sand Accumulation	
		Channel Instability/Over Widening	
	Only	Excessive Bank Erosion	
	ō	Channelization	
	SIS	Reconfigured Stream Channels	
	Channels	Artificial Banks/Shoreline	
	nar	Beaver Dam Removal	
	\overline{c}	Substrate Embeddedness	
		Lack or Excess of Woody Debris	

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	A Reference Standard	Topography essentially unaltered from the natural state, or alterations appear to have a minimal effect on wetland functioning and condition. Patch or microtopographic complexity may be slightly altered, but native plant communities are still supported.
<0.9 - 0.8	B Highly Functioning	Alterations to topography result in small but detectable changes to habitat conditions in some or all of the AA; or more severe impacts exist but affect less than 10% of the AA.
<0.8 - 0.7	C Functioning	Changes to AA topography may be pervasive but generally mild to moderate in severity. May include patches of more significant habitat alteration; or more severe alterations affect up to 20 % of the AA.
<0.7 - 0.6	D Functioning Impaired	At least one important surface type or landform has been eliminated or created; microtopography has been strongly impacted throughout most or all of the AA; or more severe alterations affect up to 50% of the AA. Evidence that widespread diminishment or alteration of native plant community exist due to physical habitat alterations. Most incidentally created wetland habitat such as that created by roadside ditches and the like would score in this range or lower.
<0.6	F Non- functioning	Pervasive geomorphic alterations have caused a fundamental change in site character and functioning, commonly resulting in a conversion to upland or deepwater habitat.

Variable 6 Score

Variable 7: Water and Soil Chemical Environment

This variable concerns the chemical environment of the soil and water media within the AA, including pollutants, water and soil characteristics. The origin of pollutants may be within or outside the AA. Score this variable by listing indicators of chemical stress in the AA. Consider point source and non-point sources of pollution, as well as mechanical or hydrologic changes that alter the chemical environment. Because water quality frequently cannot be inferred directly, the presence of stressors is often identified by the presence of indirect indicators. Five sub-variables are used to describe the Water and Soil Chemical Environment: Nutrient Enrichment/Eutrophication/Oxygen; Sedimentation/Turbidity; Toxic Contamination/PH; Temperature; and Soil Chemistry and Redox Potential. Utilization of web-based data mining tools is highly recommended to help inform and support variable scores.

Scoring rules:

- 1. Stressors are grouped into sub-variables which have a similar signature or set of causes.
- 2. Use the indicator list to identify each stressor impacting the chemical environment of the AA.
- 3. For each sub-variable, determine its score using the scoring guideline table provided on the second page of the scoring sheet. Scoring sub-variables is carried out in exactly the same way as normal variable scoring.
- -If the AA is part of a water body that is recognized as impaired or recommended for TMDL development for one of the factors, then score that sub-variable 0.65 or lower.
- 4. Transcribe sub-variable scores to the following variable scoring page and compute the sum.
- 5. The lowest sub-variable score sets the letter grade range. The composite of sub-variables influences the score within that range.

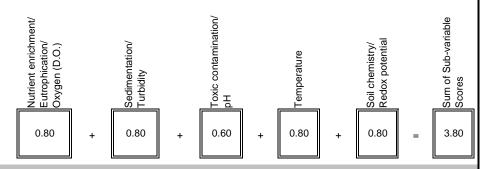
Sub-variable	Stressor Indicator	V	Comments		Sub-
	Livestock			\mathcal{N}	variable
SV 7.1	Agricultural Runoff			7 /	Score
Nutrient Enrichment/	Septic/Sewage				0.80
Eutrophication/	Excessive Algae or Aquatic Veg.				0.60
Oxygen (D.O.)	Cumulative Watershed NPS] /	
Oxygen (D.O.)	CDPHE Impairment/TMDL List]/	
				-{	
	Excessive Erosion			-/\	
	Excessive Deposition			-	
0) / 7 0	Fine Sediment Plumes			┨	
SV 7.2	Agricultural Runoff			-	0.80
Sedimentation/	Excessive Turbidity			┨╴┞	
Turbidity	Nearby Construction Site			1 /	
	Cumulative Watershed NPS			↓ /	
	CDPHE Impairment/TMDL List			4/	
		ļ		4	
	Recent Chemical Spills			-1\	
	Nearby Industrial Sites	Х	Distribution center uphill to SE	1/	
	Road Drainage/Runoff			1 /	
	Livestock			1 /	
	Agricultural Runoff				
SV 7.3	Storm Water Runoff				0.60
Toxic contamination/	Fish/Wildlife Impacts				0.00
рН	Vegetation Impacts] /	
	Cumulative Watershed NPS] /	
	Acid Mine Drainage] /	
	Point Source Discharge]/	
	CDPHE Impairment/TMDL List				
	Metal staining on rocks and veg.			1	
	Excessive Temperature Regime			\mathcal{N}	
	Lack of Shading] \	
SV 7.4	Reservoir/Power Plant Discharge] [0.80
Temperature	Industrial Discharge]	0.60
remperature	Cumulative Watershed NPS] /ੋ	·
	CDPHE Impairment/TMDL List]/	
	Unnatural Saturation/Desaturation			K	
SV 7.5	Mechanical Soil Disturbance			⊩ر ا	
Soil chemistry/	Dumping/introduced Soil	1		┨	0.80
Redox potential	CDPHE Impairment/TMDL List			┨╶┞	
redux potential	COFFIE Impairment/TwiDL List			4 /	

Variable 7: Water and Soil Chemical Environment p.2

Sub-variable Scoring Guidelines

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	A Reference Standard	Stress indicators not present or trivial.
<0.9 - 0.8		Stress indicators scarcely present and mild, or otherwise not occurring in more than 10% of the AA.
<0.8 - 0.7		Stress indicators present at mild to moderate levels, or otherwise not occurring in more than 33% of the AA.
<0.7 - 0.6		Stress indicators present at moderate to high levels, or otherwise not occurring in more than 66% of the AA
<0.6		Stress indicators strongly evident throughout the AA at levels which apparently alter the fundamental chemical environment of the wetland system

Input each sub-variable score from p. 1 of the V7 data form and calculate the sum.



Use the table to score the Chemical Environment Variable circling the applicable scoring rules.

Variable Score	Condition Grade	Scoring Rules						
000.0	0.440	Single Factor	Composite Score					
1.0 - 0.9	A Reference Standard	No single factor scores < 0.9		The factor scores sum > 4.5				
<0.9 - 0.8	B Highly Functioning	Any single factor scores ≥ 0.8 but < 0.9		The factor scores sum >4.0 but ≤4.5				
<0.8 - 0.7	C Functioning	Any single factor scores ≥ 7.0 but < 0.8		The factor scores sum >3.5 but ≤ 4.0				
<0.7 - 0.6	D Functioning Impaired	Any single factor scores ≥ 0.6 but <0.7		The factor scores sum >3.0 but ≤3.5				
< 0.6	F Non- functioning	Any single factor scores < 0.6		The factor scores sum < 3.0				

Variable 7 Score

Variable 8: Vegetation Structure and Complexity

This variable is a measure of the condition of the wetland's vegetation relative to its native state. It particularly focuses on the wetland's ability to perform higher-order functions such as support of wildlife populations, and influence primary functions such as flood-flow attenuation, channel stabilization and sediment retention. Score this variable by listing stressors that have affected the structure, diversity, composition and cover of each vegetation stratum that would normally be present in the HGM (regional) subclass being assessed. For this variable, stressor severity is a measure of how much each vegetation stratum differs functionally from its natural condition or from the natural range of variability exhibited the HGM subclass or regional subclass. This variable has four sub-variables, each corresponding to a stratum of vegetation: Tree Canopy; Shrub Layer; Herbaceous Layer; and Aquatics.

Rules for Scoring:

- 1. Determine the number and types of vegetation layers present within the AA. Make a judgment as to whether additional layers were historically present using direct evidence such as stumps, root wads or historical photographs. Indirect evidence such as local knowledge and expert opinion can also be used in this determination.
- 2. Do not score vegetation layers that would not normally be present in the wetland type being assessed.
- 3. Estimate and record the current coverage of each vegetation layer at the top of the table.
- 4. Record the Reference Standard or expected percent coverage of each vegetation layer to create the sub-variable weighting factor. The condition of predominant vegetation layers has a greater influence on the variable score than do minor components.
- 5. Enter the percent cover values as decimals in the row of the stressor table labeled "Reference/expected Percent Cover of Layer". Note, percentages will often sum to more than 100% (1.0).
- 6. Determine the severity of stressors acting on each individual canopy layers, indicating their presence with checks in the appropriate boxes of the stressor table. The difference between the expected and observed stratum coverages is one measure of stratum alteration.
- 7. Determine the sub-variable score for each valid vegetation layer using the scoring guidelines on the second page of the scoring sheet. Enter each sub-variable score in the appropriate cell of the row labeled "Veg. Layer Sub-variable Score". If a stratum has been wholly removed score it as 0.5.
- 8. Multiply each layer's *Reference Percent Cover of Layer* score by its Veg. Layer Sub-variable scores and enter the products in the labled cells. These are the weighted sub-variable scores. Individually sum the *Reference Percent Cover of Layer* and *Weighted Sub-variables scores*.
- 9. Divide the sum of "Veg. Layer Sub-variable Scores" by the total coverage of all layers scored. This product is the Variable 8 score. Enter this number in the labeled box at the bottom of this page.

	,	Vegetatio	n Layers		
Current % Coverage of					
Layer		х	х		
Stressor	Tree	Shrub	Herb	Aquatic	Comments
Noxious Weeds					
Exotic/Invasive spp.					
Tree Harvest					
Brush Cutting/Shrub Removal					
Livestock Grazing					
Excessive Herbivory					
Mowing/Haying					
Herbicide					
Loss of Zonation/Homogenization					
Dewatering					
Over Saturation					
DIFFERENCE BETWEEN CURRENT COVERAGE AND REFERENCE/EXPECTED			0		
Reference/Expected % Cover of Layer	+		1.00 +		= 1.4
Veg. Layer Sub-	X	X	X	Х	See sub-variable scoring
variable Score		8.0	8.0		guidelines on following page
variable coole	 				galacinios en lene iling page
Weighted Sub-variable					· -
Score	+	0.32 +	0.80 +		= 1.12
					Variable 8 Score 0.80

Variable 8: Vegetation Structure and Complexity p. 2

Sub-variable 8 Scoring Guidelines:
Based on the list of stressors identified above, rate the severity of their cumulative effect on vegetation structure and complexity for each vegetation layer.

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9 Reference Standard		Stressors not present or with an intensity low enough as to not detectably affect the structure, diversity or composition of the vegetation layer.
<0.9 - 0.8	B Highly Functioning	Stressors present at intensity levels sufficient to cause detectable, but minor, changes in layer composition. Stress related change should generally be less than 10% for any given attribute (e.g., 10% cover of invasive, 10% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as high as 33% for a given attribute if stressors are confined to patches comprising less than 10% of the wetland.
<0.8 - 0.7	C Functioning	Stressors present with enough intensity to cause significant changes in the character of vegetation, including alteration of layer coverage, structural complexity and species composition. The vegetation layer retains its essential character though. AA's with a high proportion of non-native grasses will commonly fall in this class. Stress related change should generally be less than 33% for any given attribute (e.g., 33% cover of invasive, 33% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as much as 66% for a given attribute if stressors are confined to patches comprising less than 25% of the wetland.
<0.7 - 0.6	D Functioning Impaired	Stressor intensity severe enough to cause profound changes to the fundamental character of the vegetation layer. Stress-related change should generally be less than 66% for any given attribute (e.g., 66% cover of invasive, 66% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as much as 80% of a given attribute if stressors are confined to patches comprising less than 50% of the wetland.
<0.6	F Non- functioning	Vegetation layer has been completely removed or altered to the extent that is no longer comparable to the natural structure, diversity and composition.

FACWet Score Card

Scoring Procedure:

- 1. Transcribe variable scores from each variable data sheet to the corresponding cell in the variable score table.
- 2. In each Functional Capacity Index (FCI) equation, enter the corresponding variable scores in the equation cells. Do not enter values in the crossed cells lacking labels.
- 3. Add the variable scores to calculate the total functional points achieved for each function.
- 4. Divide the total functional points achieved by the functional points possible. The typical number of total points possible is provided, however, if a variable is added or subtracted to FCI equation the total possible points must be adjusted.
- 5. Calculate the Composite FCI, by adding the FCI scores and dividing by the total number of functions scored (usually 7).
- 6. If scoring is done directly in the Excel spreadsheet, all values will be transferred and calculated automatically.

VARIA	BLE SCORE	TABLE								
Buffer & Landscape Context	Variable 1:	Habitat Connectivity (Connect)	0.58							
Buffi Lands Con	Variable 2:	Contributing Area (CA)	0.30							
λ£	Variable 3: Water Source (Source)									
Hydrology	Variable 4:	Water Distribution (Dist)	0.75							
主	Variable 5:	Water Outflow (Outflow)	0.75							
Biotic	Variable 6:	Geomorphology (Geom)	0.85							
Abiotic and Biotic Habitat	Variable 7:	Chemical Environment (Chem)	0.78							
Abioti	Variable 8:	Vegetation Structure and Complexity (Veg)	0.80							
Function	al Capacity									
Function 1 -	Support of Cha	Total Functional		FCI						
V1 _{connect}	+ V2 _{CA} +	(2 x V8 _{veg}) Points	· 15							
0.58	+ 0.30 +	1.60 + + + = 2.48	÷ 4 =	0.62						
Function 2 -	Support of Cha	racteristic Fish/aquatic Habitat		•						
(3 x V3 _{source})	+ (2 x V4 _{dist}) +	(2 x V5 _{outflow}) + V6 _{geom} + V7 _{chem}								
2.25	+ 1.50 +	1.50 + 0.85 + 0.78 + = 6.88	÷ 9 =	0.76						
	Flood Attenuat									
V2 _{CA}	+ (2 x V3 _{source}) +	(2 x V4 _{dist}) + (2 x V5 _{outflow}) + V6 _{geom} + V8 _{veg}								
0.30	+ 1.50 +	1.50 + 1.50 + 0.85 + 0.80 = 6.45	÷ 9 =	0.72						
		g-term Water Storage								
V3 _{source}	+ (2 x V4 _{dist}) +	(2 x V5 _{outflow}) V6 _{geom}	ı Te							
0.75	+ 1.50 +	1.50 + 0.85 + + = 4.60	÷ 6 =	0.77						
Function 5	Nutrient/Toxica	ant Removal	·							
(2 x V2 _{CA})	+ (2 x V4 _{dist}) +	V6 _{geom} V7 _{chem}	_							
0.60	+ 1.50 +	0.85 + 0.78 + + = 3.73	÷ 6 =	0.62						
Function 6 -	Sediment Rete	ntion/Shoreline Stabilization								
V2 _{CA}	+ (2 x V6 _{geom}) +									
0.30	+ 1.70 +	1.60 + + + + = 3.60	÷ 5 =	0.72						
Function 7 -	Production Ex	port/Food Chain Support								
V1 _{connect}	+ (2 x V5 _{outflow}) +	V6 _{geom} + V7 _{chem} + (2 x V8 _{veg})								
0.58	+ 1.50 +	0.85 + 0.78 + 1.60 + = 5.31	÷ 7 =	0.76						
-		Sum of Individual FCI	Scores	4.97						
		Divide by the Number of Function	ons Scored	÷ 7						

Composite FCI Score

ADMINISTRATIVE CHARACTERIZATION

General Inform	ation				Date of Evaluation:	7/20/2012				
Site Name or ID:	WL-3	'			Project Name:	I-70 Bridge	over Havana	a Street		
404 or Other Permi Application #:	t	Applicant								
Evaluator Name(s)	Elly Weber		Evaluator's p	rofe	Biologist, Pinyon Environmental					
Location Inforr	nation:									
Site Coordinates (Decimal Degrees, e. 38.85, -104.96):	g., 39.7	74947°, -104.8	63140°		Geographic Datum Used (NAD 83):	NAD 83				
36.63, -104.90).					Elevation	5293				
Location Information	n: Northwest qua	drant of I-70 a	nd Havana Inte	erc	hange, in storm v	vater storm	vater basin, s	south of East		
Associated stream/ name:	water body		N/A			Stream Ord	ler:	N/A		
USGS Quadrangle Map:	Montbello				х	1:24,000 Other	1:100,000 1:			
Sub basin Name (8 digit HUC):	10190003				CDOT					
Project Informa	ation:			х	Potentially Impa	 cted Wetlan	 ds			
This evaluation is being performed at (Check applicable bo			Purpose of Evaluation (check all applicable):		Mitigation; Pre-c Mitigation; Post- Monitoring Other (Describe)		1			
Intent of Project: (C	heck all applicable)		Restoration		□ E	inhancement		Creation		
Total Size of Wetla (Record Area, Check ar Measurement Method U	nd Describe	0.0164 ac.	Measured Estimated							
Assessment Area (Area, check appropriate bo		0.0164 ac.	Measured		ac. 0.0087	ac. 0.0078	ac.	ac.		
used to record acreage who included in a single assessi	en more than one AA is	0.0104 ac.	Estimated		ac.	ac.	ac.	ac.		
Characteristics or N AA boundary deteri		The AA bound	dary is the bou	nda	ary of the wetland	I located wh	olly within the	e AOI.		
NOTAC:	3 is located in the	ar northwest	portion of the	stu	ıdy area, in a stor	mwater bas	in with riprap	-lined trickle		

ECOLOGICAL DESCRIPTION 1

Special Cor	NOOTING .	Object of the state of the stat							
•		Check all that apply							
	s including Histosols or l e AA (i.e., AA includes o		Ш		eatened or endangered to occur in the AA?	species are			
	lirectly impact organic seas possessing either Hi								
	s are known to occur an vetland of which the AA				oncern according to the HP) are known to occur				
The wetland urbanized la	is a habitat oasis in an ndscape?	otherwise dry or			cated within a potential occurrence buffer area as				
	eatened or endangered AA? List Below.	species are KNOWN to		Other special	concerns (please desc	ribe)			
	Н	IYDROGEOMOR	PHI	C SETTIN	IG				
AA wetland	maintains its fundame	ntal natural hydrogeomo	orphic	characteristic	cs				
		nange in HGM classes a escribe the original wetla				ow.			
AA wetland	AA wetland was created from an upland setting.								
Current Co	nditions	Describe the hydrogeon that apply.	morph	ic setting of t	he wetland by circling	all conditions			
	Water source	Surface flow	(-	Groundwater	Precipitation	Unknown			
	Hydrodynamics	Inidirectional	_	Vertical	Bi-directional	,			
	Wetland Gradient	0-2%	<u>) </u>	2-4%	4-10% >10%				
	# Surface Inlets	Over-bank	0	1	2 3	>3			
HGM Setting	# Surface Outlets Geomorphic Setting (Narrative Description. Include approx. stream order for riverine)	This wetland is a depre adjacent to riprap-lined	ssion		2 3 > med in stormwater base				
	HGM class	Riverine		Slope	Depressional	Lacustrine			
Historical Co	nditions								
	Water source	Surface flow	G	Groundwater	Precipitation	Unknown			
	Hydrodynamics	Inidirectional		Vertical					
Previous wetland typology	Geomorphic Setting (Narrative Description)	This wetland has presu	mably	not changed	I since its formation.				
	Previous HGM Class	Riverine		Slope	Depressiona	Lacustrine			
Notes (include in	ormation on the AA's I	HGM subclass and regio	onal si	ubclass):					

ECOLOGICAL DESCRIPTION 2

Vegetatio System					Clas				ıbcla			ficatio		er Re					lodifi		%	ΔΛ
Palustrine				EM		F			scula	ar		vvalt	E	gime	,	Oti	ici iv	iodiii	013		00	
raiustille	Fa	liusti			EIVI			KOOLE	eu va	SCUIA	41			E							10	00
acustrine alustrine iverine		peren		Roo Unco Aqu Rock Unco Em Shru	ck Bot. n Botto atic Be ky Shor on Shor lergent lb-scru rested	e(US) re(US) (EM) b(SS)		Roote Algal Non- oad-lea edle-le Cobl Sa		cular; stent; eciduor evergre avel; ud;		S Int	empor Sasseason Seas emi-Pe ermitte Artificia t./semi	xample arily flo curated ally flood./s erm. flo ntly exp ally floo perm./s ed/peri	oded(A (B); oded(C sat.(E); oded(F oosed(ded(K) Seas. (); ⁻); G); ; Y);	Mixos Acid(a Alka Orga Be Dra Diko Artif	Eusaline(saline(s); Circi line/ca lnic(g); aver(b) ained/d Farm ed/imporicial So	9); Fres umneu Icareou Minera); Partia litched	sh(0); tral(c); us(i); al(n); ally (d); d(h); e(r);		
Site Map						ap of to			ding r	elevai	nt port	ions d	of the	wetlar	nd, AA	bour	dary,	struct	ures, i	habita	t class	ses
See Figure 3	,																					

Variable 1: Habitat Connectivity

The Habitat Connectivity Variable is described by two sub-variables – Neighboring Wetland and Riparian Habitat Loss and Barriers to Migration and Dispersal. These sub-variables were treated as independent variables in FACWet Version 2.0. The merging of these variables makes their structure more consistent with that of other composite variables in FACWet. The new variable configuration also makes this landscape variable more accurately reflect the interactions amongst aquatic habitats in Colorado's agricultural and urbanized landscapes, which have a naturally low density of wetlands. The two Habitat Connectivity Sub-variables are scored in exactly the same manner as their FACWet 2.0 counterparts, as described below. The Habitat Connectivity Variable score is simply the arithmetic average of the two sub-variable scores which is entered on the second page of the Variable 1.1 is not scored.

SV 1.1 - Neighboring Wetland and Riparian Habitat Loss

(Do not score if few or no wetlands naturally exist in the HCE)

This sub-variable is a measure of how isolated from other naturally-occurring wetlands or riparian habitat the AA has become as the result of habitat destruction. To score this sub-variable, estimate the percent of naturally-occurring wetland/riparian habitat that has been lost (by filling, draining, development, or whatever means) within the 500-meter-wide belt surrounding the AA. This zone is called the Habitat Connectivity Envelope (HCE). In most cases the evaluator must use best professional judgment to estimate the amount of natural wetland loss. Historical photographs, National Wetland Inventory (NWI) maps, hydric soil maps can be helpful in making these determinations. Floodplain maps are especially valuable in river-dominated regions, such as the Front Range urban corridor. Evaluation of landforms and habitat patterns in the context of perceivable land use change is used to steer estimates of the amount of wetland loss within the HCE.

Rules for Scoring:

- 1. On the aerial photo, create a 500 m perimeter around the AA.
- 2. The area within this perimeter is the Habitat Connectivity Envelope (HCE).
- 3. Within the HCE, outline the current extent of naturally occurring wetland and riparian habitat. Do not include habitats such as excavated ponds or reservoir induced fringe wetlands.
- 4. Outline the historical extent of wetland and riparian habitats (i.e., existing natural wetlands plus those that have been destroyed).
- Use your knowledge of the history of the area and evident land use change to identify where habitat losses have occurred. Additional research can be utilized to increase the accuracy of this estimate including consideration of floodplain maps, historical aerial photographs, soil maps, etc.
- 5. Calculate the area of existing and historical wetlands. Divide the area of existing wetland by the total amount of existing and historical wetland and riparian habitat, and determine the variable score using the guidelines below. Enter sub-variable score at the bottom of p.2 of the Habitat Connectivity data form.

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	A Reference Standard	Wetland losses are absent or negligible or there is no evidence to suggest the native landscape within the HCE historically contained other wetland habitats
<0.9 - 0.8	B Highly Functioning	More than 80% of historical wetland habitat area within the HCE is still present (less than 20% of habitat area lost).
<0.8 - 0.7	C Functioning	80 to 60% of historical wetland habitat area within the HCE is still present (20% to 40% of habitat area lost).
<0.7 - 0.6	D Functioning Impaired	Less than 60 to 25% of historical wetland habitat area within the HCE is still present (more than 40 to 75% of habitat area lost).
<0.6	F Non- functioning	Less than 25% of the historical wetland habitat area within the HCE still in existence (more than 70% of habitat lost).

	mpanea	
<0.6		Less than 25% of the historical wetland habitat area within the HCE still in existence (more than 70% of habitat lost).
Notes:		

Variable 1: Habitat Connectivity p. 2

SV 1.2: Migration/Dispersal Barriers

This sub-variable is intended to rate the degree to which the AA has become isolated from existing neighboring wetland and riparian habitat by artificial barriers that inhibit migration or dispersal of organisms. On the aerial photograph, identify the man-made barriers within the HCE that intercede between the AA and surrounding wetlands and riparian areas, and identify them by type on the stressor list. Score this variable based on the barriers' impermeability to migration and dispersal and the amount of surrounding wetland/riparian habitat they affect.

Rules for Scoring:

- 1. On the aerial photo, outline **all** existing wetland and riparian habitat areas within the HCE. This includes naturally occurring habitats, as well as those purposefully created or induced by land use change.
- 2. Identify artificial barriers to dispersal and migration of organisms within the HCE that intercede between the AA and surrounding habitats. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.
- 3. Considering the composite effect of all of identified barriers to migration and dispersal (i.e., stressors), assign an overall variable score using the scoring guidelines.

	√	Stressors	Comments/description
<i>"</i>	Х	Major Highway	I-70
ers		Secondary Highway	
barriers	Х	Tertiary Roadway	Havana Street
	Х	Railroad	Railroad spur on the west side of Havana Street, and to the SE
<u>S</u> .		Bike Path	
artificial	Х	Urban Development	Commercial, and light industrial area in Denver Metro Area
la la		Agricultural Development	
		Artificial Water Body	
Stressors		Fence	
es	Х	Ditch or Aqueduct	Concrete-lined ditch in northeast portion of study area
Str		Aquatic Organism Barriers	

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	A Reference Standard	No appreciable barriers exist between the AA and other wetland and riparian habitats in the HCE; or there are no other wetland and riparian areas in the HCE.
<0.9 - 0.8	B Highly Functioning	Barriers impeding migration/dispersal between the AA and up to 33% of surrounding wetland/riparian habitat highly permeable and easily passed by most organisms. Examples could include gravel roads, minor levees, ditches or barbed-wire fences. More significant barriers (see "functioning category below) could affect migration to up to 10% of surrounding wetland/riparian habitat.
<0.8 - 0.7	C Functioning	Barriers to migration and dispersal retard the ability of many organisms/propagules to pass between the AA and up to 66% of wetland/riparian habitat. Passage of organisms and propagules through such barriers is still possible, but it may be constrained to certain times of day, be slow, dangerous or require additional travel. Busy two-lane roads, culverted areas, small to medium artificial water bodies or small earthen dams would commonly rate a score in this range. More significant barriers (see "functioning impaired" category below) could affect migration to up to 10% of surrounding wetland/riparian habitat.
<0.7 - 0.6	D Functioning Impaired	Barriers to migration and dispersal preclude the passage of some types of organisms/propagules between the AA and up to 66% of surrounding wetland/riparian habitat. Travel of those animals which can potential negotiate the barrier are strongly restricted and may include a high chance of mortality. Up to 33% of surrounding wetland/riparian habitat could be functionally isolated from the AA.
<0.6	F Non-functioning	AA is essentially isolated from surrounding wetland/riparian habitat by impermeable migration and dispersal barriers. An interstate highway or concrete-lined water conveyance canal are examples of barriers which would generally create functional isolation between the AA and wetland/riparian habitat in the HCE.

SV 1.1 Score		Add S scores
SV 1.2 Score	0.58	two vai

Add SV 1.1 and 1.2 scores and divide by two to calculate variable score

Variable 1 Score

Variable 2: Contributing Area

The AA's Contributing Area is defined as the 250-meter-wide zone surrounding the perimeter of the AA. This variable is a measure of the capacity of that area to support characteristic functions of high quality wetland habitat. Depending on its condition, the contributing area can help maintain wetland condition or it can degrade it. Contributing Area condition is evaluated by considering the AA's Buffer and its Surrounding Land Use. Buffers are strips or patches of more-or-less natural upland and/or wetland habitat more than 5m wide. Buffers are contiquous with the AA boundary and they intercede between it and more intensively used lands. The AA Buffer is characterized with three sub-variables: Buffer Condition, Buffer Extent, and Average Buffer Width. The Surrounding Land Use Sub-variable considers changes within the Contributing Area that limit its capacity to support characteristic wetland functions. Many of the acute, on-site effects of land use change in the Contributing Area are specifically captured by Variables 3 - 8.

Rules for Scoring:

- 1. Delimit the Contributing Area on an aerial photograph as the zone within 250 meters of the outer boundary of the AA.
- 2. Evaluate and then rate the Buffer Condition sub-variable using the scoring guidelines. Record the score in the cell provided
- 3. Indicate on the aerial photograph zones surrounding the AA which have ≥5m of buffer vegetation and those which do not.
- 4. Calculate the percentage of the AA which has a Buffer and record the value where indicated on the data sheet.
- 5. Rate the Buffer Extent Sub-variable using the scoring guidelines.
- 6.Determine the average Buffer width by drawing a line perpendicularly from the AA boundary to the outer extent of the buffer habitat. Measure line length and record its value on the data sheet. Repeat this process until a total of 8 lines have been sampled.
- 7. Calculate the average buffer width and record value on the data form. Then determine the sub-variable score using the scoring guidelines.
- 8.Score the Surrounding Land Use sub-variable by recording land use changes on the stressor list that affect the capacity of the landscape to support characteristic wetland functioning.
- 9. Enter the lowest of the three Buffer sub-variable scores along with the Surrounding Land Use Sub-variable score in the Contributing Area Variable scoring formula at the bottom of p. 2 of the data form. The Contributing Area Variable is the average of the two sub-variable scores.

SV 2.1 - Buffer Condition

0.57 SV 2.1 - Buffer Condition Score

Subvariable Score	Condition Grade	Buffer Condition Scoring Guidelines
1.0 - 0.9	Reference Standard	Buffer vegetation is predominately native vegetation, human-caused disturbance of the substrate is not evident, and human visitation is minimal. Common examples: Wilderness areas, undeveloped forest and range lands.
<0.9 - 0.8	Highly Functioning	Buffer vegetation may have a mixed native-nonnative composition, but characteristic structure and complexity remain. Soils are mostly undisturbed or have recovered from past human disturbance. Little or only low-impact human visitation. Buffers with higher levels of substrate disturbance may be included here if the buffer is still able to maintain predominately native vegetation. Common examples: Dispursed camping areas in national forests, common in wildland parks (e.g. State Parks) and open spaces.
<0.8 - 0.7	Functioning	Buffer vegetation is substantially composed of non-native species. Vegetation structure may be somewhat altered, such as by brush clearing. Moderate substrate distrbance and compaction occurs, and small pockets of greater disturbance may exist. Common examples: City natural areas mountain hay meadows.
<0.7 - 0.6	Functioning Impaired	Buffer vegetation is substantially composed of non-native species and vegetation structure has been strongly altered by the complete removal of one or more strata. Soil disturbance and the intensity of human visitation are generally high. Common examples: Open lands around resource extraction sites (e.g., gravel mines), clear cut logging areas, ski slopes.
<0.6	Non-functioning	Buffer is nearly or entirely absent.

SV 2.2 - Buffer Extent

0.00 Percent of AA with Buffer

0.55 SV 2.2 - Buffer Extent

Subvariable Score	Condition Class	% Buffer Scoring Guidelines
1.0 - 0.9	Reference Standard	90 - 100% of AA with Buffer
<0.9 - 0.8	Highly Functioning	70-90% of AA with Buffer
<0.8 - 0.7	Functioning	51-69% of AA with Buffer
<0.7 - 0.6	Functioning Impaired	26-50% of AA with Buffer
<0.6	Non-functioning	0-25% of AA with Buffer

Variable 2: Contributing Area (p. 2)											
SV 2.3 - Average Buffer Width						Record r	neası	red buffer	widths in t	he space	es below and average.
Buffer		0	0	0							
Width	` '	1	2	3	4	<u>0</u> 5	<i>0</i>	7	<i>0</i>	Avg. B	<u>∐</u> uffer Width (m)
		·	_			Subvaria		Condition	n Grade		Width Scoring Guidelines
	1	SV 2.3	- Avera	ae Bu	ffer	1.0 - 0	_	Reference	Standard	Average	e Buffer width is 190-250m
0.1			/idth So	_		<0.9 - 0	_	Highly Functioning		Average	e Buffer width is 101-189m
	•					<0.8 - 0).7	Functio	oning	Averag	e Buffer width is 31-100m
						<0.7 - 0).6	Functioning	Impaired		ge Buffer width is 6-30m
						<0.6		Non-func	tioning	Avera	age Buffer width is 0-5m
SV 2.	4 - 8	Surround	ling Lan	d Use							
		/ 2.4 - 8			1						
0.5	اد	Land U				Catalog landscap			land use	changes	in the surrounding
	V	Stresso	rs		Comme	ents/des	cript	ion			
	х	Industria	al/comme	ercial				•			OT maintenance facilit
es	Х	Urban			High De	ensity de	velop	ment in D	enver an	d Comm	nerce City
ang		Residen	tial								
Ch		Rural	Farming								
lse			e Agriculi								
d L		•	s or Nurs								
= Land Use Changes		Livestoc	vestock Grazing								
1	Х		ransportation Corridor			Interstate 70 and Havana interchange					
ors			arklands								
Stressors			npoundm								
Str			Water be Resource Ex		1						
Biological Resource Extraction											
Variable Scoring Condition Grade Scoring C		Suideline	es								
1.0 -	0.9	Reference	4 e Standard	No appreciable land use change has been imposed Surrounding Landscape.					cape.		
<0.9	- 0.8		B unctioning	Some land use change has occurred in the Surrounding Landscape, but changes have minimal effect on the the landscape's capacity to support characteristic aquatic functioning, either because land use is not intensive, for example haying, light grazing, or low intensity silviculture, or more substantial changes occur in approximately less than 10% of the area.							
<0.8	- 0.7		C tioning	Surrounding Landscape has been subjected to a marked shift in land use, however, the land retain much of its capacity to support natural wetland function and it is not an overt source of pollutants of sediment. Moderate-intensity land uses such as dry-land farming, urban "green" corridors, or moderate cattle grazing would commonly be placed within this scoring range.					overt source of pollutants or n "green" corridors, or		
<0.7 - 0.6		Funct	D tioning aired	to high co considera has been urban dev	overage (up able in-flow greatly dim	s within the Surrounding Landscape has been substantial including the a moderate iup to 50%) of impermeable surfaces, bare soil, or other artificial surfaces; sw urban runoff or fertilizer-rich waters common. Supportive capacity of the land diminished but not totally extinguished. Intensively logged areas, low-density nts, some urban parklands and many cropping situations would commonly rate a ange.					
<0	<0.6		F ecological			wetland ha	bitats.	Commercia			nerwise a cause of severe ghly urban landscapes
		Buffer So			unding d Use						
	(0.1	+	0.5) ÷	2		= Var	iable 2	2 Scoi	ne 0.30

Variable 3: Water Source

This variable is concerned with **up-gradient** hydrologic connectivity. It is a measure of impacts to the AA's water source, including the quantity and timing of water delivery, and the ability of source water to perform work such as sediment transport, erosion, soil pore flushing, etc. To score this variable, identify stressors that alter the source of water to the AA, and record their presence on the stressor list. Stressors can impact water source by depletion, augmentation, or alteration of inflow timing or hydrodynamics. This variable is designed to assess water quantity, power and timing, not water quality. Water quality will be evaluated in Variable 7.

Scoring rules:

- 1. Use the stressor list and knowledge of the watershed to catalog type-specific impairments of the AA's water source. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.
- 2. Considering the composite effect of stressors on the water source, rate the condition of this variable with the aid of the scoring guidelines.

	Stressors	Comments/description
	Ditches or Drains (tile, etc.)	
	Dams	
	Diversions	
	Groundwater pumping	
	Draw-downs	
	Culverts or Constrictions	
	Point Source (urban, ind., ag.)	
	Non-point Source	
	Increased Drainage Area	
×	Storm Drain/Urban Runoff	Storm drains in vicinity flow directly to this stormwater basin.
×	Impermeable Surface Runoff	I-70 interchange and surrounding commercial and industrial area
	Irrigation Return Flows	
	Mining/Natural Gas Extraction	
	Transbasin Diversion	
	Actively Managed Hydrology	

Variable Score	Condition Grade	Depletion	Augmentation
1.0 - 0.9	A Reference Standard	Unnatural drawdown events minor, rare or non- existent, very slight uniform depletion, or trivial alteration of hydrodynamics.	Unnatural high-water events minor, rare or non- existent, slight uniform increase in amount of inflow, or trivial alteration of hydrodynamics.
<0.9 - 0.8	B Highly Functioning	Unnatural drawdown events occasional, short duration and/or mild; or uniform depletion up to 20%; or mild to moderate reduction of peak flows or capacity of water to perform work.	Occasional unnatural high-water events, short in duration and/or mild in intensity; or uniform augmentation up to 20%; or mild to moderate increase of peak flows or capacity of water to perform work.
<0.8 - 0.7	C Functioning	Unnatural drawdown events common and of mild to moderate intensity and/or duration; or uniform depletion up to 50%; or moderate to substantial reduction of peak flows or capacity of water to perform work.	Common occurrence of unnatural high-water events, of a mild to moderate intensity and/or duration; or uniform augmentation up to 50%; or moderate to substantial increase of peak flows or capacity of water to perform work.
<0.7 - 0.6	D Functioning Impaired	Unnatural drawdown events occur frequently with a moderate to high intensity and/or duration; or uniform depletion up to 75%; or substantial reduction of peak flows or capacity of water to perform work. Wetlands with actively managed or wholly artificial hydrology will usually score in this range or lower.	Common occurrence of unnatural high-water events, some of which may be severe in nature or exist for a substantial portion of the growing season; or uniform augmentation more than 50% or capacity of water to perform work. Wetlands with actively managed or wholly artificial hydrology will usually score in this range or lower.
<0.6	F Non- functioning	Water source diminished enough to threaten or extinguish wetland hydrology in the AA.	Frequency, duration or magnitude of unnaturally high-water great enough to change the fundamental characteristics of the wetland.

Variable 3 Score

Variable 4: Water Distribution

This variable is concerned with hydrologic connectivity within the AA. It is a measure of alteration to the spatial distribution of surface and groundwater within the AA. These alterations are manifested as local changes to the hydrograph and generally result from geomorphic modifications within the AA. To score this variable, identify stressors within the AA that alter flow patterns and impact the hydrograph of the AA, including localized increases or decreases to the depth or duration of the water table or surface water.

Because the wetland's ability to distribute water in a characteristic fashion is fundamentally dependent on the condition of its water source, in most cases the Water Source variable score will define the upper limit Water Distribution score. For example, if the Water Source variable is rated at 0.85, the Water Distribution score will usually have the potential to attain a maximum score of 0.85. Additional stressors within or outside the lower end of the AA effecting water distribution (e.g., ditches and levees) will reduce the score from the maximum value.

Scoring rules:

- 1. Identify impacts to the natural distribution of water throughout the AA and catalog them in the stressor table.
- 2. Considering all of the stressors identified, assign an overall variable score using the scoring guidelines. In most cases, the Water Source variable score will set the upper limit for the Water Distribution score.

√	Stressors	Comments/description
×	Alteration of Water Source	See variable 3: water source
	Ditches	
	Ponding/Impoundment	
	Culverts	
	Road Grades	
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Enlarged Channel	
	Artificial Banks/Shoreline	
	Weirs	
	Dikes/Levees/Berms	
	Diversions	
	Sediment/Fill Accumulation	

Variable Score	Condition Grade	Non-riverine	Riverine
1.0 - 0.9		Little or no alteration has been made to the way in which water is distributed throughout the wetland. AA maintains a natural hydrologic regime.	Natural active floodplain areas flood on a normal recurrence interval. No evidence of alteration of flooding and subirrigation duration and intensity.
<0.9 - 0.8	B Highly Functioning	Less than 10% of the AA is affected by in situ hydrologic alteration; or more widespread impacts result in less than a 2 in. (5 cm) change in mean growing season water table elevation.	Channel-adjacent areas have occasional unnatural periods of drying or flooding; or uniform shift in the hydrograph less than typical root depth.
<0.8 - 0.7	C Functioning	Between 10 and 33% of the AA is affected by in situ hydrologic alteration; or more widespread impacts result in a 4 in. (5 cm) or less change in mean growing season water table elevation.	In channel-adjacent area, periods of drying or flooding are common; or uniform shift in the hydrograph near root depth.
<0.7 - 0.6	D Functioning Impaired	33 to 66% of the AA is affected by <i>in situ</i> hydrologic alteration; or more widespread impacts result in a 6 in. (15 cm) or less change in mean growing season water table elevation. Water table behavior must still meet jurisdictional criteria to merit this rating.	Adjacent to the channel, unnatural periods of drying or flooding are the norm; or uniform shift in the hydrograph greater than root depth.
<0.6	F Non-functioning	More than 66% of the AA is affected by hydrologic alteration which changes the fundamental functioning of the wetland system, generally exhibited as a conversion to upland or deep water habitat.	Historical active floodplain areas are almost never wetted from overbank flooding, and/or groundwater infiltration is effectively cut off.

Variable 4 Score

Variable 5: Water Outflow

This variable is concerned with down-gradient hydrologic connectivity and the flow of water and water-borne materials and energy out of the AA. In particular it illustrates the degree to which the AA can support the functioning of down-gradient habitats. It is a measure of impacts that affect the hydrologic outflow of water including the passage of water through its normal low- and high-flow surface outlets, infiltration/groundwater recharge, and the energetic characteristics of water delivered to dependent habitats. In some cases, alteration of evapotranspiration rates may be significant enough of a factor to consider in scoring. Score this variable by identifying stressors that impact the means by which water is exported from the AA. To evaluate this variable focus on how water, energy and associated materials are exported out of the AA and their ability it support down-gradient habitats in a manner consistent with their HGM (regional) subclass.

Because the wetland's ability to export water and materials in a characteristic fashion is to a very large degree dependent the condition of its water source, as with the Water Distribution variable, in most cases the Water Source variable score will define the upper limit Water Outflow score.

Scoring rules:

- 1. Identify impacts to the natural outflow of water from the AA and catalog them in the stressor table.
- 2.Considering all of the stressors identified, assign an overall variable score using the scoring guidelines. Take in to account the cumulative effect of stressors on the wetland's ability to export water and water-borne materials. In most cases the Water Source variable will set the upper limit for the Water Outflow score.

>	Stressors	Comments/description
×	Alteration of Water Source	see variable 3: water source
	Ditches	
	Dikes/Levees	
	Road Grades	
×	Culverts	Trickle channels flow into culvert, which is outlet.
	Diversions	
	Constrictions	
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Artificial Stream Banks	
	Weirs	
	Confined Bridge Openings	

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	A Reference Standard	Stressors have little to no effect on the magnitude, timing or hydrodynamics of the AA water outflow regime.
<0.9 - 0.8	B Highly Functioning	High- or low-water outflows are mildly to moderately affected, but at intermediate ("normal") levels flow continues essentially unaltered in quantity or character.
<0.8 - 0.7	C Functioning	High- or low-water outflows are moderately affected, mild alteration of intermediate level outflow occurs; or hydrodynamics moderately affected.
<0.7 - 0.6	D Functioning Impaired	Outflow at all stages is moderately to highly impaired resulting in persistent flooding of portions of the AA or unnatural drainage; or outflow hydrodynamics severely disrupted.
<0.6	F Non-functioning	The natural outflow regime is profoundly impaired. Down-gradient hydrologic connection severed or nearly so. Alterations may cause widespread unnatural persistent flooding or dewatering of the wetland system.

Variable 5 Score

Variable 6: Geomorphology

This variable is a measure of the degree to which the geomorphic setting has been altered within the AA. Changes to the surface configuration and natural topography constitute stressors. Such stressors may be observed in the form of fill, excavation, dikes, sedimentation due to absence of flushing floods, etc. In riverine systems, geomorphic changes to the stream channel should be considered if the channel is within the AA (i.e, small is size). Alterations may involve the bed and bank (substrate embeddedness or morphological changes), stream instability, and stream channel reconfiguration. Geomorphic changes are usually ultimately manifested as changes to wetland surface hydrology and water relations with vegetation. Geomorphic alterations can also directly affect soil properties, such as near-surface texture, and the wetland chemical environment such as the redox state or nutrient composition in the rooting zone. In rating this variable, do not include these resultant effects of geomorphic change; rather focus on the physical impacts within the footprint of the alteration within the AA — For example, the width and depth of a ditch or the size of a levee within the AA would describe the extent of the stressors. The secondary effects of geomorphic change are addressed by other variables. All alterations to geomorphology should be evaluated including small-scale impacts such as pugging, hoof sheer, and sedimentation which can be significant but not immediately obvious.

Scoring Rules:

1. Identify impacts to geomorphological setting and topography within the AA and record them on the stressor checklist.

2.Considering all of the stressors identified, assign a	an overall variable score using the scoring guidelines.
---	---

/		Stressors	Comments
		Dredging/Excavation/Mining	
		Fill, including dikes, road grades, etc.	
		Grading	
	а	Compaction	
	Genera	Plowing/Disking	
	en	Excessive Sedimentation	
	0	Dumping	
		Hoof Shear/Pugging	
		Aggregate or Mineral Mining	
		Sand Accumulation	
		Channel Instability/Over Widening	
	Only	Excessive Bank Erosion	
	ō	Channelization	
	nels	Reconfigured Stream Channels	
	au c	Artificial Banks/Shoreline	
	Chan	Beaver Dam Removal	
	ਹ	Substrate Embeddedness	
		Lack or Excess of Woody Debris	

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	A Reference Standard	Topography essentially unaltered from the natural state, or alterations appear to have a minimal effect on wetland functioning and condition. Patch or microtopographic complexity may be slightly altered, but native plant communities are still supported.
<0.9 - 0.8	B Highly Functioning	Alterations to topography result in small but detectable changes to habitat conditions in some or all of the AA; or more severe impacts exist but affect less than 10% of the AA.
<0.8 - 0.7	C Functioning	Changes to AA topography may be pervasive but generally mild to moderate in severity. May include patches of more significant habitat alteration; or more severe alterations affect up to 20 % of the AA.
<0.7 - 0.6	ariable Score Grade 1.0 - 0.9 Reference Standard 1.0 - 0.8 Highly Functioning -0.8 - 0.7 C Functioning D Standard Alterations to topography result in AA; or more severe impacts exist patches of more significant habitations. At least one important surface type strongly impacted throughout most exidence that widespread diminis alterations. Most incidentally creat would score in this range or lower Pervasive geomorphic alterations.	At least one important surface type or landform has been eliminated or created; microtopography has been strongly impacted throughout most or all of the AA; or more severe alterations affect up to 50% of the AA. Evidence that widespread diminishment or alteration of native plant community exist due to physical habitat alterations. Most incidentally created wetland habitat such as that created by roadside ditches and the like would score in this range or lower.
<0.6	Non-	Pervasive geomorphic alterations have caused a fundamental change in site character and functioning, commonly resulting in a conversion to upland or deepwater habitat.

Variable 6 Score

Variable 7: Water and Soil Chemical Environment

This variable concerns the chemical environment of the soil and water media within the AA, including pollutants, water and soil characteristics. The origin of pollutants may be within or outside the AA. Score this variable by listing indicators of chemical stress in the AA. Consider point source and non-point sources of pollution, as well as mechanical or hydrologic changes that after the chemical environment. Because water quality frequently cannot be inferred directly, the presence of stressors is often identified by the presence of indirect indicators. Five sub-variables are used to describe the Water and Soil Chemical Environment: Nutrient Enrichment/Eutrophication/Oxygen; Sedimentation/Turbidity; Toxic Contamination/pH; Temperature; and Soil Chemistry and Redox Potential. Utilization of web-based data mining tools is highly recommended to help inform and support variable scores.

Scoring rules:

- 1. Stressors are grouped into sub-variables which have a similar signature or set of causes.
- 2. Use the indicator list to identify each stressor impacting the chemical environment of the AA.
- 3. For each sub-variable, determine its score using the scoring guideline table provided on the second page of the scoring sheet. Scoring sub-variables is carried out in exactly the same way as normal variable scoring.
- -If the AA is part of a water body that is recognized as impaired or recommended for TMDL development for one of the factors, then score that sub-variable 0.65 or lower.
- 4. Transcribe sub-variable scores to the following variable scoring page and compute the sum.
- 5. The lowest sub-variable score sets the letter grade range. The composite of sub-variables influences the score within that range.

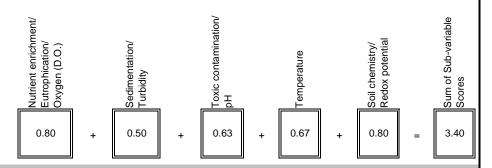
Sub-variable	Stressor Indicator	√	Comments		Sub-
	Livestock			\mathbb{Z}	variable
SV 7.1	Agricultural Runoff] _	Score
Nutrient Enrichment/	Septic/Sewage				0.80
Eutrophication/	Excessive Algae or Aquatic Veg.			_	0.00
Oxygen (D.O.)	Cumulative Watershed NPS] /	
Oxygen (D.O.)	CDPHE Impairment/TMDL List]/	
				-(
	Excessive Erosion		Otensesses herein de eine ed te	-/\	
	Excessive Deposition	Х	Stormwater basin designed to	-	
0\/7.0	Fine Sediment Plumes		trap sediment	┤┝	
SV 7.2	Agricultural Runoff			-	0.50
Sedimentation/	Excessive Turbidity			 ↓ ⊬	
Turbidity	Nearby Construction Site			↓ /	
ì	Cumulative Watershed NPS			↓ / .	
	CDPHE Impairment/TMDL List			-1/	
				-{	
	Recent Chemical Spills			-1\	
SV 7.3	Nearby Industrial Sites	Х	Warehouses etc. to north and	4\	
	Road Drainage/Runoff		west	」	
	Livestock			」 \	
	Agricultural Runoff			J /₌	
	Storm Water Runoff				0.63
Toxic contamination/	Fish/Wildlife Impacts			_	0.00
рН	Vegetation Impacts			」 /	
	Cumulative Watershed NPS			」 /	
	Acid Mine Drainage			J /	
	Point Source Discharge			」 /	
	CDPHE Impairment/TMDL List				
	Metal staining on rocks and veg.				
<u> </u>	Excessive Temperature Regime			/ L	
	Lack of Shading	Х	No trees for shade	」 \	
SV 7.4	Reservoir/Power Plant Discharge			┧	0.67
Temperature	Industrial Discharge			_l L	0.07
remperature	Cumulative Watershed NPS] /ੋ	·
	CDPHE Impairment/TMDL List]/	
	Unnatural Saturation/Desaturation			-{	
SV 7.5	Mechanical Soil Disturbance			⊩ر ا⊦	
Soil chemistry/	Dumping/introduced Soil	 		┨ ║	0.80
Redox potential	CDPHE Impairment/TMDL List	1		┨╱┸	
	ODI TIE IMPAITMONT HVIDE LIST	1		⊣ /	

Variable 7: Water and Soil Chemical Environment p.2

Sub-variable Scoring Guidelines

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	A Reference Standard	Stress indicators not present or trivial.
<0.9 - 0.8	B Highly Functioning	Stress indicators scarcely present and mild, or otherwise not occurring in more than 10% of the AA.
<0.8 - 0.7	C Functioning	Stress indicators present at mild to moderate levels, or otherwise not occurring in more than 33% of the AA.
<0.7 - 0.6	D Functioning Impaired	Stress indicators present at moderate to high levels, or otherwise not occurring in more than 66% of the AA
<0.6	F Non-functioning	Stress indicators strongly evident throughout the AA at levels which apparently alter the fundamental chemical environment of the wetland system

Input each sub-variable score from p. 1 of the V7 data form and calculate the sum.



Use the table to score the Chemical Environment Variable circling the applicable scoring rules.

Variable Score	Condition Grade	Scoring Rules								
000.0	0.000	Single Factor		Composite Score						
1.0 - 0.9	A Reference Standard	No single factor scores < 0.9		The factor scores sum > 4.5						
<0.9 - 0.8	B Highly Functioning	Any single factor scores ≥ 0.8 but < 0.9		The factor scores sum >4.0 but ≤4.5						
<0.8 - 0.7	C Functioning	Any single factor scores ≥ 7.0 but < 0.8		The factor scores sum >3.5 but ≤ 4.0						
<0.7 - 0.6	D Functioning Impaired	Any single factor scores ≥ 0.6 but <0.7		The factor scores sum >3.0 but ≤3.5						
< 0.6	F Non- functioning	Any single factor scores < 0.6		The factor scores sum < 3.0						

Variable 7 Score

Variable 8: Vegetation Structure and Complexity

This variable is a measure of the condition of the wetland's vegetation relative to its native state. It particularly focuses on the wetland's ability to perform higher-order functions such as support of wildlife populations, and influence primary functions such as flood-flow attenuation, channel stabilization and sediment retention. Score this variable by listing stressors that have affected the structure, diversity, composition and cover of each vegetation stratum that would normally be present in the HGM (regional) subclass being assessed. For this variable, stressor severity is a measure of how much each vegetation stratum differs functionally from its natural condition or from the natural range of variability exhibited the HGM subclass or regional subclass. This variable has four sub-variables, each corresponding to a stratum of vegetation: Tree Canopy; Shrub Layer; Herbaceous Layer; and Aquatics.

Rules for Scoring:

- 1. Determine the number and types of vegetation layers present within the AA. Make a judgment as to whether additional layers were historically present using direct evidence such as stumps, root wads or historical photographs. Indirect evidence such as local knowledge and expert opinion can also be used in this determination.
- 2. Do not score vegetation layers that would not normally be present in the wetland type being assessed.
- 3. Estimate and record the current coverage of each vegetation layer at the top of the table.
- 4. Record the Reference Standard or expected percent coverage of each vegetation layer to create the sub-variable weighting factor. The condition of predominant vegetation layers has a greater influence on the variable score than do minor components.
- 5. Enter the percent cover values as decimals in the row of the stressor table labeled "Reference/expected Percent Cover of Layer". Note, percentages will often sum to more than 100% (1.0).
- 6. Determine the severity of stressors acting on each individual canopy layers, indicating their presence with checks in the appropriate boxes of the stressor table. The difference between the expected and observed stratum coverages is one measure of stratum alteration.
- 7. Determine the sub-variable score for each valid vegetation layer using the scoring guidelines on the second page of the scoring sheet. Enter each sub-variable score in the appropriate cell of the row labeled "Veg. Layer Sub-variable Score". If a stratum has been wholly removed score it as 0.5.
- 8. Multiply each layer's *Reference Percent Cover of Layer* score by its Veg. Layer Sub-variable scores and enter the products in the labled cells. These are the weighted sub-variable scores. Individually sum the *Reference Percent Cover of Layer* and *Weighted Sub-variables scores*.
- 9. Divide the sum of "Veg. Layer Sub-variable Scores" by the total coverage of all layers scored. This product is the Variable 8 score. Enter this number in the labeled box at the bottom of this page.

	١	/egetatio	n Layers		
Current % Coverage of					
Layer			Х		
Stressor	Tree	Shrub	Herb	Aquatic	Comments
Noxious Weeds					
Exotic/Invasive spp.					
Tree Harvest					
Brush Cutting/Shrub Removal					
Livestock Grazing					
Excessive Herbivory					
Mowing/Haying					
Herbicide					
Loss of Zonation/Homogenization					
Dewatering					
Over Saturation					
DIFFERENCE BETWEEN CURRENT COVERAGE AND REFERENCE/EXPECTED			0		
Reference/Expected % Cover of Layer	+ X	+ X	1.00 +	. X	= 1
Veg. Layer Sub-					See sub-variable scoring
variable Score			8.0		guidelines on following page
Weighted Sub-variable Score	+	+	0.80 +		= 0.8
					Variable 8 Score 0.80

Variable 8: Vegetation Structure and Complexity p. 2

Sub-variable 8 Scoring Guidelines:
Based on the list of stressors identified above, rate the severity of their cumulative effect on vegetation structure and complexity for each vegetation layer.

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	A Reference Standard	Stressors not present or with an intensity low enough as to not detectably affect the structure, diversity or composition of the vegetation layer.
<0.9 - 0.8	B Highly Functioning	Stressors present at intensity levels sufficient to cause detectable, but minor, changes in layer composition. Stress related change should generally be less than 10% for any given attribute (e.g., 10% cover of invasive, 10% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as high as 33% for a given attribute if stressors are confined to patches comprising less than 10% of the wetland.
<0.8 - 0.7	C Functioning	Stressors present with enough intensity to cause significant changes in the character of vegetation, including alteration of layer coverage, structural complexity and species composition. The vegetation layer retains its essential character though. AA's with a high proportion of non-native grasses will commonly fall in this class. Stress related change should generally be less than 33% for any given attribute (e.g., 33% cover of invasive, 33% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as much as 66% for a given attribute if stressors are confined to patches comprising less than 25% of the wetland.
<0.7 - 0.6	D Functioning Impaired	Stressor intensity severe enough to cause profound changes to the fundamental character of the vegetation layer. Stress-related change should generally be less than 66% for any given attribute (e.g., 66% cover of invasive, 66% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as much as 80% of a given attribute if stressors are confined to patches comprising less than 50% of the wetland.
<0.6	F Non- functioning	Vegetation layer has been completely removed or altered to the extent that is no longer comparable to the natural structure, diversity and composition.

FACWet Score Card

Scoring Procedure:

- 1. Transcribe variable scores from each variable data sheet to the corresponding cell in the variable score table.
- 2. In each Functional Capacity Index (FCI) equation, enter the corresponding variable scores in the equation cells. Do not enter values in the crossed cells lacking labels.
- 3. Add the variable scores to calculate the total functional points achieved for each function.
- 4. Divide the total functional points achieved by the functional points possible. The typical number of total points possible is provided, however, if a variable is added or subtracted to FCI equation the total possible points must be adjusted.
- 5. Calculate the Composite FCI, by adding the FCI scores and dividing by the total number of functions scored (usually 7).
- 6. If scoring is done directly in the Excel spreadsheet, all values will be transferred and calculated automatically.

VARIA	BLE SCORE	TABLE		
Buffer & Landscape Context	Variable 1:	Habitat Connectivity (Connect)	0.58	
Buffi Lands Con	Variable 2:	Contributing Area (CA)	0.30	
λ£	Variable 3:	Water Source (Source)	0.70	
Hydrology	Variable 4:	Water Distribution (Dist)	0.70	
Í	Variable 5:	Water Outflow (Outflow)	0.70	
Biotic	Variable 6:	Geomorphology (Geom)	0.80	
Abiotic and Biotic Habitat	Variable 7:	Chemical Environment (Chem)	0.68	
Abioti	Variable 8:	Vegetation Structure and Complexity (Veg)	0.80	
Function	al Capacity			
	Support of Cha	Total Functional		FCI
V1 _{connect}	+ V2 _{CA} +	(2 x V8 _{veg}) Points	· 15	
0.58	+ 0.30 +	1.60 + + + = 2.48	÷ 4 =	0.62
Function 2 -	Support of Cha	racteristic Fish/aquatic Habitat		•
(3 x V3 _{source})	+ (2 x V4 _{dist}) +	(2 x V5 _{outflow}) + V6 _{geom} + V7 _{chem}		
2.10	+ 1.40 +	1.40 + 0.80 + 0.68 + = 6.38	÷ 9 =	0.71
Function 3 -	Flood Attenuat			
V2 _{CA}	+ (2 x V3 _{source}) +	(2 x V4 _{dist}) + (2 x V5 _{outflow}) + V6 _{geom} + V8 _{veg}		
0.30	+ 1.40 +	1.40 + 1.40 + 0.80 + 0.80 = 6.10	÷ 9 =	0.68
		g-term Water Storage		
V3 _{source}	+ (2 x V4 _{dist}) +	(2 x V5 _{outflow}) V6 _{geom}	ı Te	
0.70	+ 1.40 +	1.40 + 0.80 + = 4.30	÷ 6 =	0.72
Function 5 -	Nutrient/Toxica	ant Removal		
(2 x V2 _{CA})	+ (2 x V4 _{dist}) +	V6 _{geom} V7 _{chem}	_	
0.60	+ 1.40 +	0.80 + 0.68 + + = 3.48	÷ 6 =	0.58
Function 6 -	Sediment Rete	ntion/Shoreline Stabilization		
V2 _{CA}	+ (2 x V6 _{geom}) +	(2 x V8 _{veg})	_	
0.30	+ 1.60 +	1.60 + + + = 3.50	÷ 5 =	0.70
		port/Food Chain Support		
V1 _{connect}	+ (2 x V5 _{outflow}) +	V6 _{geom} + V7 _{chem} + (2 x V8 _{veg})		
0.58	+ 1.40 +	0.80 + 0.68 + 1.60 + = 5.06	÷ 7 =	0.72
		Sum of Individual FCI	Scores	4.73
		Divide by the Number of Function	ons Scored	÷ 7

Composite FCI Score

ADMINISTRATIVE CHARACTERIZATION

General Informa	ation					Date of Evaluation:	7/30/201	3			
Site Name or ID:	WL-4	-				Project Name:	I-70 Brid	ge over Hava	ına Street		
404 or Other Permit Application #:						Applicant Name:	CDOT				
Evaluator Name(s):	Elly Weber		Evaluator's p	rofe	essional position and organization:	Biologis	Biologist, Pinyon Environmental				
Location Inform	ation:										
Site Coordinates (Decimal Degrees, e.g 38.85, -104.96):	., 39.7	74947°, -104	4.80	63140°		Geographic Datum Used (NAD 83):	NAD 83				
00.00, 101.00).						Elevation		5293			
Location Information	: Just outside in	iterchange o	f H	lavana Street	and	d I-70, southeast	quadrant				
Associated stream/wname:	ater body			N/A			Stream C	Order:	N/A		
USGS Quadrangle Map:	Montbello				Map Scale: (Circle one)	х	1:24,000 Other	1:100,000 1:			
Sub basin Name (8 digit HUC):	10190003					Wetland Ownership:	CDOT				
Project Informa	tion:				Х	Potentially Impa	cted Wetl	ands			
This evaluation is being performed at: (Check applicable box	× Project We Mitigation 8			Purpose of Evaluation (check all applicable):		Mitigation; Pre-o Mitigation; Post- Monitoring Other (Describe)	-construct				
Intent of Project: (Ch	eck all applicable)			Restoration		☐ En	hancemen	. 🗆	Creation		
Total Size of Wetlan (Record Area, Check and Measurement Method Us	Describe	0.0192 ac.	Х	Measured Estimated							
Assessment Area (A Area, check appropriate box.		0.0192ac.	Х	Measured		ac.	ac.	ac.	ac.		
used to record acreage wher included in a single assessm		0.013246.		Estimated		ac.	ac.	ac.	ac.		
Characteristics or M AA boundary determ		The AA bou	und	lary is the bou	nda	ary of the wetland	d located v	wholly within	the AOI.		
Notos.	is located in a loete-lined canal, i		g tl	he west side c	of H	lavana Street, ju	st to the s	outh of the er	nd of the		

ECOLOGICAL DESCRIPTION 1

Special Cor	ncerns	Check all that apply				
Organic soils	s including Histosols or I	Histic Epipedons are				species are
present in th	e AA (i.e., AA includes o	core ren nabitat).		SUSPECTEL	to occur in the AA?	
		•				
				•	•	
		otherwise dry or		or element or		
		species are KNOWN to		Other special	concerns (please desc	cribe)
	Н	IYDROGEOMOR	PHI	C SETTIN	IG	
AA wetland	maintains its fundame	ntal natural hydrogeom	orphic	characteristic	cs	
	,	O .				low.
AA wetland	was created from an u	ıpland setting.				
Current Co	nditions	Describe the hydrogeo that apply.	morph	ic setting of t	he wetland by circling	all conditions
	If the above is checked, please describe the case of t		G	Groundwater	Precipitation	Unknown
	including areas possessing either Histosol soils or histic epipedons. Organic soils are known to occur anywhere within the contiguous wetland of which the AA is part. The wetland is a habitat oasis in an otherwise dry or urbanized landscape? Federally threatened or endangered species are KNOW occur in the AA? List Below. HYDROGEOM AA wetland maintains its fundamental natural hydroge in HGM class if the above is checked, please describe the original of the above is checked, please describe the hydroge in HGM class. AA wetland was created from an upland setting. Describe the hydroge in HGM class is the apply. Water source Surface flow Hydrodynamics Over-bate in Hydrodynamics Over-bate in Hydrodynamics Over-bate in Hydrodynamics is the Hydrodynamics of the Hydrodynamics of the Hydrodynamics of the Hydrodynamics over-bate in HGM class Riverine Previous HGM Class Riverine Previous Hydrodynamics Indidectional Over-bate in Hydrodynamics of the Hydrodynamics			Vertical	Bi-directional	
	Wetland Gradient	(- 2%	<u>6) </u>	2-4%	4-10% >10%	6
	# Surface Inlets	Over-bank	0	$\overline{}$	2 3	>3
HGM Setting		(ري	1	2 3 >	-3
J	Setting (Narrative Description. Include approx. stream order for	This wetland is a depre	ession	al wetland for	med in a roadside dito	ch.
	HGM class	Riverine		Slope	Depressional	Lacustrine
Organic soils including Histosols or Histic Epipedons are present in the AA (i.e., AA includes core fen habitat). Project will directly impact organic soil portions of the AA including areas possessing either Histosol soils or histic epipedons. Organic soils are known to occur anywhere within the configuous wetland of which the AA is part. The wetland is a habitat oasis in an otherwise dry or urbanized landscape? Federally threatened or endangered species are KNOWN to occur in the AA? The wetland is a habitat oasis in an otherwise dry or urbanized landscape? Federally threatened or endangered species are KNOWN to occur in the AA? List Below. HYDROGEOMORPHIC SETTING AA wetland maintains its fundamental natural hydrogeomorphic characteristics AA wetland has been subject to change in HGM classes as a result of anthropogenic modification if the above is checked, please describe the original wetland type if discernable using the table below. AA wetland was created from an upland setting. Current Conditions						
	Water source	Surface flow	G	Groundwater	Precipitation	Unknown
	Hydrodynamics	Unidirectional		Vertical		
	(Narrative Description)	This wetland has presu	ımably	not changed	I since its formation.	
		Riverine		Slope	Depressiona	Lacustrine
Notes (include in	ormation on the AA's I	HGM subclass and region	onal si	ubclass):		

ECOLOGICAL DESCRIPTION 2

System	Q.	heve	tom		Clas	c		Sı	ıbcla	SS			\/\/a+	er Re	aima		Oth	ner M	1odifi	ers	% /	ΔΛ								
Palustrine		Subsystem Palustrine											EM		F	Roote			ar		vvalt	E	gime	,	Oti	ici iv	iodili	CIS		00
Palustrine	Talustille			strine Palust				EM			KOOLE	ed va	SCUIA	ar .			E								<u></u>					
Lacustrine Littoral; Limnora Palustrine Palustrine Lower perennial; Upper perennial; Intermittent		nial;	Unco Aqua Rock Unco Em Shru	ck Bot. n Botto atic Be ky Shor on Shor nergent ub-scru rested	e(US) re(US) (EM) b(SS)		Floating vascular; Rooted vascular; Algal; Persistent; Non-Persistent; Broad-leaved deciduous; Needle-leaved evergreen; Cobble - gravel; Sand; Mud; Organic					Examples Temporarily flooded(A); Saturated(B); Seasonally flooded(C); Seasflood./sat.(E); Semi-Perm. flooded(F); Intermittently exposed(G); Artificially flooded(K); Sat./semiperm./Seas. (Y); Int. exposed/permenant(Z)					Hypersaline(7); Eusaline(8); Mixosaline(9); Fresh(0); Acid(a); Circumneutral(c); Alkaline/calcareous(f); Organic(g); Mineral(n); Beaver(b); Partially Drained/ditched(d); Farmed(f); Diked/impounded(h); Artificial Substrate(r); Spoil(s); Excavated(x)													
Site Map cale: 1 sq. =						ap of to ant fea			ding r	elevai	nt port	ions d	of the	wetlar	nd, AA	boun	dary,	struct	ures, i	habita	t class	ses								
See Figure	3																													
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Variable 1: Habitat Connectivity

The Habitat Connectivity Variable is described by two sub-variables – Neighboring Wetland and Riparian Habitat Loss and Barriers to Migration and Dispersal. These sub-variables were treated as independent variables in FACWet Version 2.0. The merging of these variables makes their structure more consistent with that of other composite variables in FACWet. The new variable configuration also makes this landscape variable more accurately reflect the interactions amongst aquatic habitats in Colorado's agricultural and urbanized landscapes, which have a naturally low density of wetlands. The two Habitat Connectivity Sub-variables are scored in exactly the same manner as their FACWet 2.0 counterparts, as described below. The Habitat Connectivity Variable score is simply the arithmetic average of the two sub-variable scores which is entered on the second page of the Variable 1.1 is not scored.

SV 1.1 - Neighboring Wetland and Riparian Habitat Loss

(Do not score if few or no wetlands naturally exist in the HCE)

This sub-variable is a measure of how isolated from other naturally-occurring wetlands or riparian habitat the AA has become as the result of habitat destruction. To score this sub-variable, estimate the percent of naturally-occurring wetland/riparian habitat that has been lost (by filling, draining, development, or whatever means) within the 500-meter-wide belt surrounding the AA. This zone is called the Habitat Connectivity Envelope (HCE). In most cases the evaluator must use best professional judgment to estimate the amount of natural wetland loss. Historical photographs, National Wetland Inventory (NWI) maps, hydric soil maps can be helpful in making these determinations. Floodplain maps are especially valuable in river-dominated regions, such as the Front Range urban corridor. Evaluation of landforms and habitat patterns in the context of perceivable land use change is used to steer estimates of the amount of wetland loss within the HCE.

Rules for Scoring:

- 1. On the aerial photo, create a 500 m perimeter around the AA.
- 2. The area within this perimeter is the Habitat Connectivity Envelope (HCE).
- 3. Within the HCE, outline the current extent of naturally occurring wetland and riparian habitat. Do not include habitats such as excavated ponds or reservoir induced fringe wetlands.
- 4. Outline the historical extent of wetland and riparian habitats (i.e., existing natural wetlands plus those that have been destroyed).
- Use your knowledge of the history of the area and evident land use change to identify where habitat losses have occurred. Additional research can be utilized to increase the accuracy of this estimate including consideration of floodplain maps, historical aerial photographs, soil maps, etc.
- 5. Calculate the area of existing and historical wetlands. Divide the area of existing wetland by the total amount of existing and historical wetland and riparian habitat, and determine the variable score using the guidelines below. Enter sub-variable score at the bottom of p.2 of the Habitat Connectivity data form.

Variable Score	Condition Grade	Scoring Guidelines	
1.0 - 0.9	A Reference Standard	Wetland losses are absent or negligible or there is no evidence to suggest the native landscape within the HCE historically contained other wetland habitats	
<0.9 - 0.8	B Highly Functioning	(less than 20% of habitat area lost).	
<0.8 - 0.7	C Functioning	80 to 60% of historical wetland habitat area within the HCE is still present (20% to 40% of habitat area lost).	
<0.7 - 0.6	D Functioning Impaired	Less than 60 to 25% of historical wetland habitat area within the HCE is still present (more than 40 to 75% of habitat area lost).	
<0.6	F Non- functioning	Less than 25% of the historical wetland habitat area within the HCE still in existence (more than 70% of habitat lost).	

<0.7 - 0.6	Impaired	(more than 40 to 75% of habitat area lost).
<0.6		Less than 25% of the historical wetland habitat area within the HCE still in existence (more than 70% of habitat lost).
Notes:		

Variable 1: Habitat Connectivity p. 2

SV 1.2: Migration/Dispersal Barriers

This sub-variable is intended to rate the degree to which the AA has become isolated from existing neighboring wetland and riparian habitat by artificial barriers that inhibit migration or dispersal of organisms. On the aerial photograph, identify the man-made barriers within the HCE that intercede between the AA and surrounding wetlands and riparian areas, and identify them by type on the stressor list. Score this variable based on the barriers' impermeability to migration and dispersal and the amount of surrounding wetland/riparian habitat they affect.

Rules for Scoring:

- 1. On the aerial photo, outline **all** existing wetland and riparian habitat areas within the HCE. This includes naturally occurring habitats, as well as those purposefully created or induced by land use change.
- 2. Identify artificial barriers to dispersal and migration of organisms within the HCE that intercede between the AA and surrounding habitats. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.
- 3. Considering the composite effect of all of identified barriers to migration and dispersal (i.e., stressors), assign an overall variable score using the scoring guidelines.

	√	Stressors	Comments/description
<i>"</i>	х	Major Highway	I-70
barriers		Secondary Highway	
ari	Х	Tertiary Roadway	Havana Street
ğ	х	Railroad	Railroad spur on the west side of Havana Street, and to the SE
S.		Bike Path	
artificial	Х	Urban Development	Commercial, and light industrial area in Denver Metro Area
a E		Agricultural Development	
		Artificial Water Body	
Sor		Fence	
Stressors	Х	Ditch or Aqueduct	Concrete-lined ditch in northeast portion of study area
Str		Aquatic Organism Barriers	
1			

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	A Reference Standard	No appreciable barriers exist between the AA and other wetland and riparian habitats in the HCE; or there are no other wetland and riparian areas in the HCE.
<0.9 - 0.8	B Highly Functioning	Barriers impeding migration/dispersal between the AA and up to 33% of surrounding wetland/riparian habitat highly permeable and easily passed by most organisms. Examples could include gravel roads, minor levees, ditches or barbed-wire fences. More significant barriers (see "functioning category below) could affect migration to up to 10% of surrounding wetland/riparian habitat.
<0.8 - 0.7	C Functioning	Barriers to migration and dispersal retard the ability of many organisms/propagules to pass between the AA and up to 66% of wetland/riparian habitat. Passage of organisms and propagules through such barriers is still possible, but it may be constrained to certain times of day, be slow, dangerous or require additional travel. Busy two-lane roads, culverted areas, small to medium artificial water bodies or small earthen dams would commonly rate a score in this range. More significant barriers (see "functioning impaired" category below) could affect migration to up to 10% of surrounding wetland/riparian habitat.
<0.7 - 0.6	D Functioning Impaired	Barriers to migration and dispersal preclude the passage of some types of organisms/propagules between the AA and up to 66% of surrounding wetland/riparian habitat. Travel of those animals which can potential negotiate the barrier are strongly restricted and may include a high chance of mortality. Up to 33% of surrounding wetland/riparian habitat could be functionally isolated from the AA.
<0.6	F Non-functioning	AA is essentially isolated from surrounding wetland/riparian habitat by impermeable migration and dispersal barriers. An interstate highway or concrete-lined water conveyance canal are examples of barriers which would generally create functional isolation between the AA and wetland/riparian habitat in the HCE.

SV 1.1 Score		Add SV 1.1 a scores and di
SV 1.2 Score	0.58	two to calcu variable so

d SV 1.1 and 1.2
res and divide by
wo to calculate
variable score

Val

Variable 1 Score

Variable 2: Contributing Area

The AA's Contributing Area is defined as the 250-meter-wide zone surrounding the perimeter of the AA. This variable is a measure of the capacity of that area to support characteristic functions of high quality wetland habitat. Depending on its condition, the contributing area can help maintain wetland condition or it can degrade it. Contributing Area condition is evaluated by considering the AA's Buffer and its Surrounding Land Use. Buffers are strips or patches of more-or-less natural upland and/or wetland habitat more than 5m wide. Buffers are contiquous with the AA boundary and they intercede between it and more intensively used lands. The AA Buffer is characterized with three sub-variables: Buffer Condition, Buffer Extent, and Average Buffer Width. The Surrounding Land Use Sub-variable considers changes within the Contributing Area that limit its capacity to support characteristic wetland functions. Many of the acute, on-site effects of land use change in the Contributing Area are specifically captured by Variables 3 - 8.

Rules for Scoring:

- 1. Delimit the Contributing Area on an aerial photograph as the zone within 250 meters of the outer boundary of the AA.
- 2. Evaluate and then rate the Buffer Condition sub-variable using the scoring guidelines. Record the score in the cell provided
- 3. Indicate on the aerial photograph zones surrounding the AA which have ≥5m of buffer vegetation and those which do not.
- 4. Calculate the percentage of the AA which has a Buffer and record the value where indicated on the data sheet.
- 5. Rate the Buffer Extent Sub-variable using the scoring guidelines.
- 6.Determine the average Buffer width by drawing a line perpendicularly from the AA boundary to the outer extent of the buffer habitat. Measure line length and record its value on the data sheet. Repeat this process until a total of 8 lines have been sampled.
- 7. Calculate the average buffer width and record value on the data form. Then determine the sub-variable score using the scoring guidelines.
- 8.Score the Surrounding Land Use sub-variable by recording land use changes on the stressor list that affect the capacity of the landscape to support characteristic wetland functioning.
- 9. Enter the lowest of the three Buffer sub-variable scores along with the Surrounding Land Use Sub-variable score in the Contributing Area Variable scoring formula at the bottom of p. 2 of the data form. The Contributing Area Variable is the average of the two sub-variable scores.

SV 2.1 - Buffer Condition

0.57 SV 2.1 - Buffer Condition Score

Subvariable Score	Condition Grade	Buffer Condition Scoring Guidelines
1.0 - 0.9	Reference Standard	Buffer vegetation is predominately native vegetation, human-caused disturbance of the substrate is not evident, and human visitation is minimal. Common examples: Wilderness areas, undeveloped forest and range lands.
<0.9 - 0.8	Highly Functioning	Buffer vegetation may have a mixed native-nonnative composition, but characteristic structure and complexity remain. Soils are mostly undisturbed or have recovered from past human disturbance. Little or only low-impact human visitation. Buffers with higher levels of substrate disturbance may be included here if the buffer is still able to maintain predominately native vegetation. Common examples: Dispursed camping areas in national forests, common in wildland parks (e.g. State Parks) and open spaces.
<0.8 - 0.7	Functioning	Buffer vegetation is substantially composed of non-native species. Vegetation structure may be somewhat altered, such as by brush clearing. Moderate substrate distrbance and compaction occurs, and small pockets of greater disturbance may exist. Common examples: City natural areas, mountain hay meadows.
<0.7 - 0.6	Functioning Impaired	Buffer vegetation is substantially composed of non-native species and vegetation structure has been strongly altered by the complete removal of one or more strata. Soil disturbance and the intensity of human visitation are generally high. Common examples: Open lands around resource extraction sites (e.g., gravel mines), clear cut logging areas, ski slopes.
<0.6	Non-functioning	Buffer is nearly or entirely absent.

SV 2.2 - Buffer Extent

0.00 Percent of AA with Buffer

0.55 SV 2.2 - Buffer Extent

Subvariable Score	Condition Class	% Buffer Scoring Guidelines	
1.0 - 0.9	Reference Standard	90 - 100% of AA with Buffer	
<0.9 - 0.8	Highly Functioning	70-90% of AA with Buffer	
<0.8 - 0.7	Functioning	51-69% of AA with Buffer	
<0.7 - 0.6	Functioning Impaired	26-50% of AA with Buffer	
<0.6	Non-functioning	0-25% of AA with Buffer	

<u>Var</u>	Variable 2: Contributing Area (p. 2)								
SV 2.	SV 2.3 - Average Buffer Width Record measured buffer widths in the spaces below and average.				v and average.				
	Buffer		0	0 0		0	1 Avg. Buffer W	idth (m)	
Lile # 1 Z G			•	Subvariable Score	Condition			coring Guidelines	
0.2 SV 2.3 - Average Bu				ffer	1.0 - 0.9	Reference S	Standard	Average Buffer	width is 190-250m
Width Score				<0.9 - 0.8	Highly Fund			width is 101-189m	
					<0.8 - 0.7 <0.7 - 0.6	Function Functioning	·		r width is 31-100m er width is 6-30m
				<0.6	Non-functi			er width is 0-5m	
SV 2.	4 - 8	Surrounding Lan	d Use		-				
		/ 2.4 - Surrour		Į	Catalanand	o la o va a ta vissa	land	ahanasa in tha	a
0.5		Land Use Sco	_		landscape and		iana use	changes in the	surrounaing
	J	Stressors		Comme	ents/descrip	tion			
	х	Industrial/comme	ercial						aintenance facilit
jes	Х	Urban		High De	ensity develo	oment in De	enver an	d Commerce (City
= Land Use Changes		Residential							
<u>ڄ</u>		Rural Dryland Farming							-
Jse		Intensive Agricult							
ام ک		Orchards or Nurs							
Lar		Livestock Grazin							
II	Х	Transportation C		Interstate 70 and Havana interchange					
Stressors		Urban Parklands							
ess		Dams/impoundm							
Str		Artificial Water be Physical Resource Ex							
		Biological Resource B							
		-							
Vari Sco		Condition Grade				Scoring G	uideline	es	
1.0 -	0.9	A Reference Standard			use change has				
<0.9	- 0.8	B Highly Functioning	effect on t land use i	the the land s not intens	dscape's capacit	y to support che haying, light o	naracteristi grazing, or	low intensity silvid	ing, either because
<0.8	- 0.7	C Functioning	much of it sediment.	s capacity Moderate	to support natur	al wetland fund ses such as dr	ction and it ry-land farr	is not an overt so ning, urban "greer	ever, the land retains urce of pollutants or " corridors, or
Land use changes within the Surrounding Landscape has been substantial including the a to high coverage (up to 50%) of impermeable surfaces, bare soil, or other artificial surface considerable in-flow urban runoff or fertilizer-rich waters common. Supportive capacity of has been greatly diminished but not totally extinguished. Intensively logged areas, low-de urban developments, some urban parklands and many cropping situations would common score within this range.			cial surfaces; capacity of the land as, low-density						
*CO.6 F Non-functioning F Non-functioning The Surrounding Landscape is essentially comletely developed or is otherwise a cause of sever ecological stress on wetland habitats. Commercial developments or highly urban landscapes generally rate a score of less than 0.6.									
		Buffer Score		unding					
		(Lowest score)	∟and	l Use					
(0.2 + 0.5) ÷ 2 = Variable 2 Score 0.35			0.35						

Variable 3: Water Source

This variable is concerned with **up-gradient** hydrologic connectivity. It is a measure of impacts to the AA's water source, including the quantity and timing of water delivery, and the ability of source water to perform work such as sediment transport, erosion, soil pore flushing, etc. To score this variable, identify stressors that alter the source of water to the AA, and record their presence on the stressor list. Stressors can impact water source by depletion, augmentation, or alteration of inflow timing or hydrodynamics. This variable is designed to assess water quantity, power and timing, not water quality. Water quality will be evaluated in Variable 7.

Scoring rules:

- 1. Use the stressor list and knowledge of the watershed to catalog type-specific impairments of the AA's water source. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.
- 2. Considering the composite effect of stressors on the water source, rate the condition of this variable with the aid of the scoring guidelines.

/	Stressors	Comments/description
	Ditches or Drains (tile, etc.)	
	Dams	
	Diversions	
	Groundwater pumping	
	Draw-downs	
	Culverts or Constrictions	
	Point Source (urban, ind., ag.)	
	Non-point Source	
	Increased Drainage Area	
	Storm Drain/Urban Runoff	
×	Impermeable Surface Runoff	I-70 interchange and surrounding commercial and industrial area
	Irrigation Return Flows	
	Mining/Natural Gas Extraction	
	Transbasin Diversion	
	Actively Managed Hydrology	

Variable Score	Condition Grade	Depletion	Augmentation
1.0 - 0.9	A Reference Standard	Unnatural drawdown events minor, rare or non- existent, very slight uniform depletion, or trivial alteration of hydrodynamics.	Unnatural high-water events minor, rare or non- existent, slight uniform increase in amount of inflow, or trivial alteration of hydrodynamics.
<0.9 - 0.8	B Highly Functioning	Unnatural drawdown events occasional, short duration and/or mild; or uniform depletion up to 20%; or mild to moderate reduction of peak flows or capacity of water to perform work.	Occasional unnatural high-water events, short in duration and/or mild in intensity; or uniform augmentation up to 20%; or mild to moderate increase of peak flows or capacity of water to perform work.
<0.8 - 0.7	C Functioning	Unnatural drawdown events common and of mild to moderate intensity and/or duration; or uniform depletion up to 50%; or moderate to substantial reduction of peak flows or capacity of water to perform work.	Common occurrence of unnatural high-water events, of a mild to moderate intensity and/or duration; or uniform augmentation up to 50%; or moderate to substantial increase of peak flows or capacity of water to perform work.
<0.7 - 0.6	D Functioning Impaired	Unnatural drawdown events occur frequently with a moderate to high intensity and/or duration; or uniform depletion up to 75%; or substantial reduction of peak flows or capacity of water to perform work. Wetlands with actively managed or wholly artificial hydrology will usually score in this range or lower.	Common occurrence of unnatural high-water events, some of which may be severe in nature or exist for a substantial portion of the growing season; or uniform augmentation more than 50% or capacity of water to perform work. Wetlands with actively managed or wholly artificial hydrology will usually score in this range or lower.
<0.6	F Non- functioning	Water source diminished enough to threaten or extinguish wetland hydrology in the AA.	Frequency, duration or magnitude of unnaturally high-water great enough to change the fundamental characteristics of the wetland.

Variable 3 Score

Variable 4: Water Distribution

This variable is concerned with hydrologic connectivity within the AA. It is a measure of alteration to the spatial distribution of surface and groundwater within the AA. These alterations are manifested as local changes to the hydrograph and generally result from geomorphic modifications within the AA. To score this variable, identify stressors within the AA that alter flow patterns and impact the hydrograph of the AA, including localized increases or decreases to the depth or duration of the water table or surface water.

Because the wetland's ability to distribute water in a characteristic fashion is fundamentally dependent on the condition of its water source, in most cases the Water Source variable score will define the upper limit Water Distribution score. For example, if the Water Source variable is rated at 0.85, the Water Distribution score will usually have the potential to attain a maximum score of 0.85. Additional stressors within or outside the lower end of the AA effecting water distribution (e.g., ditches and levees) will reduce the score from the maximum value.

Scoring rules:

- 1. Identify impacts to the natural distribution of water throughout the AA and catalog them in the stressor table.
- 2. Considering all of the stressors identified, assign an overall variable score using the scoring guidelines. In most cases, the Water Source variable score will set the upper limit for the Water Distribution score.

✓	Stressors	Comments/description
×	Alteration of Water Source	See variable 3: water source
	Ditches	
	Ponding/Impoundment	
	Culverts	
	Road Grades	
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Enlarged Channel	
	Artificial Banks/Shoreline	
	Weirs	
	Dikes/Levees/Berms	
	Diversions	
	Sediment/Fill Accumulation	

Variable Score	Condition Grade	Non-riverine	Riverine
1.0 - 0.9		Little or no alteration has been made to the way in which water is distributed throughout the wetland. AA maintains a natural hydrologic regime.	Natural active floodplain areas flood on a normal recurrence interval. No evidence of alteration of flooding and subirrigation duration and intensity.
<0.9 - 0.8	B Highly Functioning	Less than 10% of the AA is affected by in situ hydrologic alteration; or more widespread impacts result in less than a 2 in. (5 cm) change in mean growing season water table elevation.	Channel-adjacent areas have occasional unnatural periods of drying or flooding; or uniform shift in the hydrograph less than typical root depth.
<0.8 - 0.7 C Functioning		Between 10 and 33% of the AA is affected by in situ hydrologic alteration; or more widespread impacts result in a 4 in. (5 cm) or less change in mean growing season water table elevation.	In channel-adjacent area, periods of drying or flooding are common; or uniform shift in the hydrograph near root depth.
<0.7 - 0.6	D Functioning Impaired	33 to 66% of the AA is affected by in situ hydrologic alteration; or more widespread impacts result in a 6 in. (15 cm) or less change in mean growing season water table elevation. Water table behavior must still meet jurisdictional criteria to merit this rating.	Adjacent to the channel, unnatural periods of drying or flooding are the norm; or uniform shift in the hydrograph greater than root depth.
<0.6	F Non-functioning	More than 66% of the AA is affected by hydrologic alteration which changes the fundamental functioning of the wetland system, generally exhibited as a conversion to upland or deep water habitat.	Historical active floodplain areas are almost never wetted from overbank flooding, and/or groundwater infiltration is effectively cut off.

Variable 4 Score

Variable 5: Water Outflow

This variable is concerned with down-gradient hydrologic connectivity and the flow of water and water-borne materials and energy out of the AA. In particular it illustrates the degree to which the AA can support the functioning of down-gradient habitats. It is a measure of impacts that affect the hydrologic outflow of water including the passage of water through its normal low- and high-flow surface outlets, infiltration/groundwater recharge, and the energetic characteristics of water delivered to dependent habitats. In some cases, alteration of evapotranspiration rates may be significant enough of a factor to consider in scoring. Score this variable by identifying stressors that impact the means by which water is exported from the AA. To evaluate this variable focus on how water, energy and associated materials are exported out of the AA and their ability it support down-gradient habitats in a manner consistent with their HGM (regional) subclass.

Because the wetland's ability to export water and materials in a characteristic fashion is to a very large degree dependent the condition of its water source, as with the Water Distribution variable, in most cases the Water Source variable score will define the upper limit Water Outflow score.

Scoring rules:

- 1. Identify impacts to the natural outflow of water from the AA and catalog them in the stressor table.
- 2.Considering all of the stressors identified, assign an overall variable score using the scoring guidelines. Take in to account the cumulative effect of stressors on the wetland's ability to export water and water-borne materials. In most cases the Water Source variable will set the upper limit for the Water Outflow score.

/	Stressors	Comments/description
×	Alteration of Water Source	See variable 3: water source
	Ditches	
	Dikes/Levees	
	Road Grades	
	Culverts	
	Diversions	
	Constrictions	
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Artificial Stream Banks	
	Weirs	
	Confined Bridge Openings	

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	A Reference Standard	Stressors have little to no effect on the magnitude, timing or hydrodynamics of the AA water outflow regime.
<0.9 - 0.8	B Highly Functioning	High- or low-water outflows are mildly to moderately affected, but at intermediate ("normal") levels flow continues essentially unaltered in quantity or character.
<0.8 - 0.7	C Functioning	High- or low-water outflows are moderately affected, mild alteration of intermediate level outflow occurs; or hydrodynamics moderately affected.
<0.7 - 0.6	D Functioning Impaired	Outflow at all stages is moderately to highly impaired resulting in persistent flooding of portions of the AA or unnatural drainage; or outflow hydrodynamics severely disrupted.
<0.6	F Non-functioning	The natural outflow regime is profoundly impaired. Down-gradient hydrologic connection severed or nearly so. Alterations may cause widespread unnatural persistent flooding or dewatering of the wetland system.

Variable 5 Score

Variable 6: Geomorphology

This variable is a measure of the degree to which the geomorphic setting has been altered within the AA. Changes to the surface configuration and natural topography constitute stressors. Such stressors may be observed in the form of fill, excavation, dikes, sedimentation due to absence of flushing floods, etc. In riverine systems, geomorphic changes to the stream channel should be considered if the channel is within the AA (i.e, small is size). Alterations may involve the bed and bank (substrate embeddedness or morphological changes), stream instability, and stream channel reconfiguration. Geomorphic changes are usually ultimately manifested as changes to wetland surface hydrology and water relations with vegetation. Geomorphic alterations can also directly affect soil properties, such as near-surface texture, and the wetland chemical environment such as the redox state or nutrient composition in the rooting zone. In rating this variable, do not include these resultant effects of geomorphic change; rather focus on the physical impacts within the footprint of the alteration within the AA — For example, the width and depth of a ditch or the size of a levee within the AA would describe the extent of the stressors. The secondary effects of geomorphic change are addressed by other variables. All alterations to geomorphology should be evaluated including small-scale impacts such as pugging, hoof sheer, and sedimentation which can be significant but not immediately obvious.

Scoring Rules:

1. Identify impacts to geomorphological setting and topography within the AA and record them on the stressor checklist. 2.Considering all of the stressors identified, assign an overall variable score using the scoring guidelines.

\		Stressors	Comments
		Dredging/Excavation/Mining	
		Fill, including dikes, road grades, etc.	
		Grading	
	=	Compaction	
	General	Plowing/Disking	
	en	Excessive Sedimentation	
	0	Dumping	
		Hoof Shear/Pugging	
		Aggregate or Mineral Mining	
×		Sand Accumulation	From road grit from Havana Street
		Channel Instability/Over Widening	
	Only	Excessive Bank Erosion	
	ō	Channelization	
	SIS	Reconfigured Stream Channels	
	eu (Artificial Banks/Shoreline	
	hannels	Beaver Dam Removal	
	$\ddot{\circ}$	Substrate Embeddedness	
		Lack or Excess of Woody Debris	

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	A Reference Standard	Topography essentially unaltered from the natural state, or alterations appear to have a minimal effect on wetland functioning and condition. Patch or microtopographic complexity may be slightly altered, but native plant communities are still supported.
<0.9 - 0.8	B Highly Functioning	Alterations to topography result in small but detectable changes to habitat conditions in some or all of the AA; or more severe impacts exist but affect less than 10% of the AA.
<0.8 - 0.7	C Functioning	Changes to AA topography may be pervasive but generally mild to moderate in severity. May include patches of more significant habitat alteration; or more severe alterations affect up to 20 % of the AA.
<0.7 - 0.6	D Functioning Impaired	At least one important surface type or landform has been eliminated or created; microtopography has been strongly impacted throughout most or all of the AA; or more severe alterations affect up to 50% of the AA. Evidence that widespread diminishment or alteration of native plant community exist due to physical habitat alterations. Most incidentally created wetland habitat such as that created by roadside ditches and the like would score in this range or lower.
<0.6	F Non- functioning	Pervasive geomorphic alterations have caused a fundamental change in site character and functioning, commonly resulting in a conversion to upland or deepwater habitat.

Variable 6 Score

Variable 7: Water and Soil Chemical Environment

This variable concerns the chemical environment of the soil and water media within the AA, including pollutants, water and soil characteristics. The origin of pollutants may be within or outside the AA. Score this variable by listing indicators of chemical stress in the AA. Consider point source and non-point sources of pollution, as well as mechanical or hydrologic changes that after the chemical environment. Because water quality frequently cannot be inferred directly, the presence of stressors is often identified by the presence of indirect indicators. Five sub-variables are used to describe the Water and Soil Chemical Environment: Nutrient Enrichment/Eutrophication/Oxygen; Sedimentation/Turbidity; Toxic Contamination/pH; Temperature; and Soil Chemistry and Redox Potential. Utilization of web-based data mining tools is highly recommended to help inform and support variable scores.

Scoring rules:

- 1. Stressors are grouped into sub-variables which have a similar signature or set of causes.
- 2. Use the indicator list to identify each stressor impacting the chemical environment of the AA.
- 3. For each sub-variable, determine its score using the scoring guideline table provided on the second page of the scoring sheet. Scoring sub-variables is carried out in exactly the same way as normal variable scoring.
- -If the AA is part of a water body that is recognized as impaired or recommended for TMDL development for one of the factors, then score that sub-variable 0.65 or lower.
- 4. Transcribe sub-variable scores to the following variable scoring page and compute the sum.
- 5. The lowest sub-variable score sets the letter grade range. The composite of sub-variables influences the score within that range.

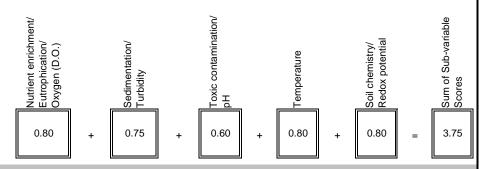
Sub-variable	Stressor Indicator	<u> </u>	Comments		Sub-
	Livestock			\mathcal{N}	variable
SV 7.1	Agricultural Runoff] \	Score
SV 7.1 Nutrient Enrichment/	Septic/Sewage				0.80
Eutrophication/	Excessive Algae or Aquatic Veg.			_	0.00
Oxygen (D.O.)	Cumulative Watershed NPS] /	
Oxygen (D.O.)	CDPHE Impairment/TMDL List			1/	
				4	
	Excessive Erosion			-/\	
0)/70	Excessive Deposition	Х	Road grit from Havana Street	1/	
	Fine Sediment Plumes			↓	
SV 7.2	Agricultural Runoff			4	0.75
Sedimentation/	Excessive Turbidity			┨╴╏	
Turbidity	Nearby Construction Site			1 /	
	Cumulative Watershed NPS			1/	
	CDPHE Impairment/TMDL List			4/	
				4	
	Recent Chemical Spills			1	
	Nearby Industrial Sites	Х	Industrial areas to north and we	<u> </u>	
	Road Drainage/Runoff			1 /	
	Livestock			1 \	
	Agricultural Runoff			1 \	
SV 7.3	Storm Water Runoff			_	0.60
Toxic contamination/	Fish/Wildlife Impacts			_	
рН	Vegetation Impacts			1 /	
	Cumulative Watershed NPS			↓ /	
	Acid Mine Drainage			.	
	Point Source Discharge			1/	
	CDPHE Impairment/TMDL List			-1/	
	Metal staining on rocks and veg.			1	
	Excessive Temperature Regime	<u> </u>		1/	
	Lack of Shading] /	
SV 7.4	Reservoir/Power Plant Discharge	<u> </u>		.	0.80
Temperature	Industrial Discharge			_	0.00
remperature	Cumulative Watershed NPS] /	
	CDPHE Impairment/TMDL List			1/	
	Unnatural Saturation/Desaturation			- (
SV 7.5	Mechanical Soil Disturbance	1		┨ ``┈	
Soil chemistry/	Dumping/introduced Soil	-		┨ ║	0.80
Redox potential	- "	-		┨╶┦	
	CDPHE Impairment/TMDL List	1		1 /	

Variable 7: Water and Soil Chemical Environment p.2

Sub-variable Scoring Guidelines

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	A Reference Standard	Stress indicators not present or trivial.
<0.9 - 0.8	B Highly Functioning	Stress indicators scarcely present and mild, or otherwise not occurring in more than 10% of the AA.
<0.8 - 0.7	C Functioning	Stress indicators present at mild to moderate levels, or otherwise not occurring in more than 33% of the AA.
<0.7 - 0.6	D Functioning Impaired	Stress indicators present at moderate to high levels, or otherwise not occurring in more than 66% of the AA
<0.6	F Non-functioning	Stress indicators strongly evident throughout the AA at levels which apparently alter the fundamental chemical environment of the wetland system

Input each sub-variable score from p. 1 of the V7 data form and calculate the sum.



Use the table to score the Chemical Environment Variable circling the applicable scoring rules.

Variable Score	Condition Grade	Scoring Rules						
ocore	Orace	Single Factor	Composite Score					
1.0 - 0.9	A Reference Standard	No single factor scores < 0.9		The factor scores sum > 4.5				
<0.9 - 0.8	B Highly Functioning	Any single factor scores ≥ 0.8 but < 0.9		The factor scores sum >4.0 but ≤4.5				
<0.8 - 0.7	C Functioning	Any single factor scores ≥ 7.0 but < 0.8		The factor scores sum >3.5 but ≤ 4.0				
<0.7 - 0.6	D Functioning Impaired	Any single factor scores ≥ 0.6 but <0.7		The factor scores sum >3.0 but ≤3.5				
< 0.6	F Non- functioning	Any single factor scores < 0.6		The factor scores sum < 3.0				

Variable 7 Score

Variable 8: Vegetation Structure and Complexity

This variable is a measure of the condition of the wetland's vegetation relative to its native state. It particularly focuses on the wetland's ability to perform higher-order functions such as support of wildlife populations, and influence primary functions such as flood-flow attenuation, channel stabilization and sediment retention. Score this variable by listing stressors that have affected the structure, diversity, composition and cover of each vegetation stratum that would normally be present in the HGM (regional) subclass being assessed. For this variable, stressor severity is a measure of how much each vegetation stratum differs functionally from its natural condition or from the natural range of variability exhibited the HGM subclass or regional subclass. This variable has four sub-variables, each corresponding to a stratum of vegetation: Tree Canopy; Shrub Layer; Herbaceous Layer; and Aquatics.

Rules for Scoring:

- 1. Determine the number and types of vegetation layers present within the AA. Make a judgment as to whether additional layers were historically present using direct evidence such as stumps, root wads or historical photographs. Indirect evidence such as local knowledge and expert opinion can also be used in this determination.
- 2. Do not score vegetation layers that would not normally be present in the wetland type being assessed.
- 3. Estimate and record the current coverage of each vegetation layer at the top of the table.
- 4. Record the Reference Standard or expected percent coverage of each vegetation layer to create the sub-variable weighting factor. The condition of predominant vegetation layers has a greater influence on the variable score than do minor components.
- 5. Enter the percent cover values as decimals in the row of the stressor table labeled "Reference/expected Percent Cover of Layer". Note, percentages will often sum to more than 100% (1.0).
- 6. Determine the severity of stressors acting on each individual canopy layers, indicating their presence with checks in the appropriate boxes of the stressor table. The difference between the expected and observed stratum coverages is one measure of stratum alteration.
- 7. Determine the sub-variable score for each valid vegetation layer using the scoring guidelines on the second page of the scoring sheet. Enter each sub-variable score in the appropriate cell of the row labeled "Veg. Layer Sub-variable Score". If a stratum has been wholly removed score it as 0.5.
- 8. Multiply each layer's *Reference Percent Cover of Layer* score by its Veg. Layer Sub-variable scores and enter the products in the labled cells. These are the weighted sub-variable scores. Individually sum the *Reference Percent Cover of Layer* and *Weighted Sub-variables scores*.
- 9. Divide the sum of "Veg. Layer Sub-variable Scores" by the total coverage of all layers scored. This product is the Variable 8 score. Enter this number in the labeled box at the bottom of this page.

	,	Vegetatio	n Layers		
Current % Coverage of					
Layer		х	х		
Stressor	Tree	Shrub	Herb	Aquatic	Comments
Noxious Weeds					
Exotic/Invasive spp.					
Tree Harvest					
Brush Cutting/Shrub Removal					
Livestock Grazing					
Excessive Herbivory					
Mowing/Haying					
Herbicide					
Loss of Zonation/Homogenization					
Dewatering					
Over Saturation					
DIFFERENCE BETWEEN CURRENT COVERAGE AND REFERENCE/EXPECTED			0		
Reference/Expected % Cover of Layer	+				= 1.1
Veg. Layer Sub-	X	X	X	Х	See sub-variable scoring
variable Score		0.8	8.0		guidelines on following page
	II	II	II	II	
Weighted Sub-variable Score	+	0.08 +	0.80 +		= 0.88
					Variable 8 Score 0.80

Variable 8: Vegetation Structure and Complexity p. 2

Sub-variable 8 Scoring Guidelines:
Based on the list of stressors identified above, rate the severity of their cumulative effect on vegetation structure and complexity for each vegetation layer.

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	A Reference Standard	Stressors not present or with an intensity low enough as to not detectably affect the structure, diversity or composition of the vegetation layer.
<0.9 - 0.8	B Highly Functioning	Stressors present at intensity levels sufficient to cause detectable, but minor, changes in layer composition. Stress related change should generally be less than 10% for any given attribute (e.g., 10% cover of invasive, 10% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as high as 33% for a given attribute if stressors are confined to patches comprising less than 10% of the wetland.
<0.8 - 0.7	C Functioning	Stressors present with enough intensity to cause significant changes in the character of vegetation, including alteration of layer coverage, structural complexity and species composition. The vegetation layer retains its essential character though. AA's with a high proportion of non-native grasses will commonly fall in this class. Stress related change should generally be less than 33% for any given attribute (e.g., 33% cover of invasive, 33% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as much as 66% for a given attribute if stressors are confined to patches comprising less than 25% of the wetland.
<0.7 - 0.6	D Functioning Impaired	Stressor intensity severe enough to cause profound changes to the fundamental character of the vegetation layer. Stress-related change should generally be less than 66% for any given attribute (e.g., 66% cover of invasive, 66% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as much as 80% of a given attribute if stressors are confined to patches comprising less than 50% of the wetland.
<0.6	F Non- functioning	Vegetation layer has been completely removed or altered to the extent that is no longer comparable to the natural structure, diversity and composition.

FACWet Score Card

Scoring Procedure:

- 1. Transcribe variable scores from each variable data sheet to the corresponding cell in the variable score table.
- 2. In each Functional Capacity Index (FCI) equation, enter the corresponding variable scores in the equation cells. Do not enter values in the crossed cells lacking labels.
- 3. Add the variable scores to calculate the total functional points achieved for each function.
- 4. Divide the total functional points achieved by the functional points possible. The typical number of total points possible is provided, however, if a variable is added or subtracted to FCI equation the total possible points must be adjusted.
- 5. Calculate the Composite FCI, by adding the FCI scores and dividing by the total number of functions scored (usually 7).
- 6. If scoring is done directly in the Excel spreadsheet, all values will be transferred and calculated automatically.

VARIA	BLE SCORE	TABLE		_
Buffer & Landscape Context	Variable 1:	Habitat Connectivity (Connect)	0.58	
Buffi Lands Con	Variable 2:	Contributing Area (CA)	0.35	
33	Variable 3:	Water Source (Source)	0.75	
Hydrology	Variable 4:	Water Distribution (Dist)	0.75	
Í.	Variable 5:	Water Outflow (Outflow)	0.75	
Siotic	Variable 6:	Geomorphology (Geom)	0.79	
Abiotic and Biotic Habitat	Variable 7:	Chemical Environment (Chem)	0.73	
Abioti P	Variable 8:	Vegetation Structure and Complexity (Veg)	0.80	
Function	al Capacity	Indices		2
Function 1 -	Support of Cha	Total Functional		FCI
V1 _{connect}	+ V2 _{CA} +	(2 x V8 _{veg}) Points		FCI
0.58	+ 0.35 +	1.60 + + + = 2.53	÷ 4 =	0.63
Function 2 -	Support of Cha	aracteristic Fish/aquatic Habitat		
(3 x V3 _{source})		$(2 \times V5_{\text{outflow}}) + V6_{\text{geom}} + V7_{\text{chem}}$		
2.25	+ 1.50 +		÷ 9 =	0.75
Function 3 -	Flood Attenuat	ion		
V2 _{CA}	+ (2 x V3 _{source}) +	(2 x V4 _{dist}) + (2 x V5 _{outflow}) + V6 _{geom} + V8 _{veg}	1	
0.35	+ 1.50 +	1.50 + 1.50 + 0.79 + 0.80 = 6.44	÷ 9 =	0.72
Function 4 -	Short- and Lon	g-term Water Storage		
V3 _{source}	+ (2 x V4 _{dist}) +	(2 x V5 _{outflow}) V6 _{geom}		
0.75	+ 1.50 +	1.50 + 0.79 + + = 4.54	÷ 6 =	0.76
Function 5 -	Nutrient/Toxica	ant Removal		
(2 x V2 _{CA})	+ (2 x V4 _{dist}) +	V6 _{geom} V7 _{chem}		
0.70	+ 1.50 +	0.79 + 0.73 + + = 3.72	÷ 6 =	0.62
Function 6 -	Sediment Rete	ntion/Shoreline Stabilization		
V2 _{CA}	+ (2 x V6 _{geom}) +	(2 x V8 _{veg})		
0.35	+ 1.58 +		÷ 5 =	0.71
Function 7 -	Production Ex	port/Food Chain Support	-	<u> </u>
V1 _{connect}	+ (2 x V5 _{outflow}) +	V6 _{geom} + V7 _{chem} + (2 x V8 _{veg})	1	
0.58	+ 1.50 +	0.79 + 0.73 + 1.60 + = 5.20	÷ 7 =	0.74
		Sum of Individual FCI	Scores	4.93
		Divide by the Number of Function	ons Scored	÷ 7
		2as 27 the Hamber of Fariotic		<u></u>

Composite FCI Score

Note: The following FACWet form was completed for a wetland delineated

on November 18, 2013. To be consistent with the previous

delineation's numbering structure, Globeville Outfall AA-1, as shown on the FACWet form, was assigned WET-Culv02 in the body of this

memorandum.

ADMINISTRATIVE CHARACTERIZATION

				_				
General Informat	ion				Date of Evaluation:			
Site Name or ID:	Globeville Outf	fall AA-1		!	Project Name:	I70 East Su	pplemental D	DEIS
404 or Other Permit Application #:	404 Permit bei	ing processed		<u>А</u> р		Colorado De Transportati	epartment of ion	
Evaluator Name(s):	Karin McShea		Evaluator's prof	ess	sional position and organization:	Biologist, Pi	inyon Enviror	nmental
Location Informa	ation:							
Site Coordinates (Decimal Degrees, e.g., 38.85, -104.96):		76380°, -104.97	77010°		Geographic Datum Used (NAD 83):		WGS 84	
,					Elevation	1	5,172 feet	
Location Information:	intersection for S.Platte River							
Associated stream/waname:	iter body	Un-named dra	inage ditch.	_		Stream Orde	er:	n/a
USGS Quadrangle Map:	Commerce City	y, CO	y, CO Map Scale: (Circle one)			(1:24,000) 1:100,000 Other 1:		
Sub basin Name (8 digit HUC):	Middle South F 10190003	Platte - Cherry	Platte - Cherry Creek, Wetland Ownership:			City and County of Denver Parks and Rec - Globeville Landing Park		
Project Informati	on:			Х	Potentially Imp	pacted Wetl	ands	
This evaluation is being performed at: (Check applicable box)	X Project Wei		(Crieck all					
Intent of Project: (Che	ck all applicable)		Restoration		F	Enhancement		Creation
Total Size of Wetland (Record Area, Check and D Measurement Method Used	Describe	0.0025 ac. X	Measured Estimated					
Assessment Area (AA Area, check appropriate box. A	Additional spaces are	0.0025 ac.	Measured	_	0.0025 ac.	ac.	ac.	ac.
used to record acreage when n included in a single assessmen		0.0020 0	Estimated		ac.	ac.	ac.	ac.
Characteristics or Met AA boundary determir		The AA bo	undary include	∌s tl	the entire wetla project.		being impac	ted by the
Notes: was co and sic collecti	etland is a small onstructed with led ded flume at the ion of sediment through the syst d area.	loose riprap on e downstream e t that has accum	the bottom an end of the dete mulated within	nd s entic the	sides of the det on area. The v e rip-rapped de	tention area, wetland is loc etention area	, with a concr cated on a sn . Although w	rete bottomed mall vater freely

ECOLOGICAL DESCRIPTION 1

Special Co	oncerns	Check all that apply								
	oils including Histosols or the AA (i.e., AA includes					atened or er to possibly				
	I directly impact organic s reas possessing either H									
_	oils are known to occur and wetland of which the AA	•		Species of concern according to the Colorado Natural Heritage (CNHP) are known to occur in the AA?						
	nd is a habitat oasis in an landscape?	otherwise dry or		Other	special	concerns (p	lease descr	ibe)		
	hreatened or endangered e AA? List Below.	species are KNOWN to		Other	special	concerns (p	lease descr	ibe)		
	HYDROGEOMORPHIC SETTING									
AA wetlan	d maintains its fundame d has been subject to chave is checked, please de d was created from an o	nange in HGM classes a escribe the original wetla	s a re	sult of	anthrop	ogenic mo		w.		
Current Co	onditions	Describe the hydrogeol that apply.	morpł	nic setti	ing of th	ne wetland b	by circling a	all conditions		
	Water source	Surface flow	(Ground	water	Precipi	tation	Unknown		
	Hydrodynamics	Unidirectional		Vertic	cal	Bi-directional				
	Wetland Gradient	0 - 2%		2-4%		4-10% >10%				
	# Surface Inlets	Over-bank	C	\supseteq	1	2	3	>3		
HGM Setting	# Surface Outlets		0	\supset	1	2	3	>3		
	Geomorphic Setting (Narrative Description. Include approx. stream order for riverine)	Wetland associated wit	th a storm water detention area.							
	HGM class	Riverine		Slop	ре	Depres	sional	Lacustrine		
Historical Co	onditions	_								
	Water source	Surface flow	C	Fround	water	Precipi	tation	Unknown		
	Hydrodynamics	Unidirectional		Vertic	cal					
Previous wetland typolog	Geomorphic Setting (Narrative Description)	Wetland associated wit	h a st	orm wa	ater det	ention area				
	Previous HGM Class	Riverine		Slop	pe	Depres	sional	Lacustrine		
Notes (include i	nformation on the AA's I	HGM subclass and region	nal s	ubclass	s): The	wetland is lo	ocated in a	storm water		

Notes (include information on the AA's HGM subclass and regional subclass): The wetland is located in a storm water detention area. Soil/sediment material in the AA is coarse and is indicative of road maintenance material. Water ponds behind a corrugated metal and concrete detention wall, then when the detention area is filled, overflows the detention wall over a wide concrete flume through riprap and into the South Platte River. The detention area is located in a depression relative to the surrounding landscape.

ECOLOGICAL DESCRIPTION 2

/egetation					_						ciassi			_						al. (19		^ ^
System		osyst			Clas				ıbcla				wate	er Re	gime)	Oti	ner iv	1odifi	ers	%	AA
Palustrine	Fa	lustri			EM			Roote	su va	Scule	11			E					r		10	00
																						_
custrine Littoral; Limnora llustrine Palustrine Lower perennial; Upper perennial; Intermittent		nial;	Roo Unco Aqu Rock Unco Em Shru	ck Bot. n Botto atic Berky Shor on Shor nergentur ub-scrul rested (e(RS) re(US) (EM) b(SS)	Non-Persistent;				Examples Temporarily flooded(A); Saturated(B); Seasonally flooded(C); Seasflood/sat.(E); Semi-Perm. flooded(F); Intermittently exposed(G); Artificially flooded(K); Sat./semiperm./Seas. (Y); Int. exposed/permenant(Z)			Hypersaline(7); Eusaline(8); Mixosaline(9); Fresh(0); Acid(a); Circumneutral(c); Alkaline/calcareous(i); Organic(g); Mineral(n); Beaver(b); Partially Drained/ditched(d); Farmed(f); Diked/impounded(h); Artificial Substrate(r); Spoil(s); Excavated(x)									
Site Map						ap of t ant fea			ding r	elevai	nt port	ions d	of the	wetlar	nd, AA	boun	dary,	struct	ures,	habita	t class	ses
P	lease	see	Figu	ıres	1 and	12																
																						L

Variable 1: Habitat Connectivity

The Habitat Connectivity Variable is described by two sub-variables – Neighboring Wetland and Riparian Habitat Loss and Barriers to Migration and Dispersal. These sub-variables were treated as independent variables in FACWet Version 2.0. The merging of these variables makes their structure more consistent with that of other composite variables in FACWet. The new variable configuration also makes this landscape variable more accurately reflect the interactions amongst aquatic habitats in Colorado's agricultural and urbanized landscapes, which have a naturally low density of wetlands. The two Habitat Connectivity Sub-variables are scored in exactly the same manner as their FACWet 2.0 counterparts, as described below. The Habitat Connectivity Variable score is simply the arithmetic average of the two sub-variable scores which is entered on the second page of the Variable 1 data form. If there is little or no wetland or riparian habitat in the Habitat Connectivity Envelope (defined below), then Sub-variable 1.1 is not scored.

SV 1.1 - Neighboring Wetland and Riparian Habitat Loss

(Do not score if few or no wetlands naturally exist in the HCE)

This sub-variable is a measure of how isolated from other naturally-occurring wetlands or riparian habitat the AA has become as the result of habitat destruction. To score this sub-variable, estimate the percent of naturally-occurring wetland/riparian habitat that has been lost (by filling, draining, development, or whatever means) within the 500-meter-wide belt surrounding the AA. This zone is called the Habitat Connectivity Envelope (HCE). In most cases the evaluator must use best professional judgment to estimate the amount of natural wetland loss. Historical photographs, National Wetland Inventory (NWI) maps, hydric soil maps can be helpful in making these determinations. Floodplain maps are especially valuable in river-dominated regions, such as the Front Range urban corridor. Evaluation of landforms and habitat patterns in the context of perceivable land use change is used to steer estimates of the amount of wetland loss within the HCE.

Rules for Scoring:

- 1. On the aerial photo, create a 500 m perimeter around the AA.
- 2. The area within this perimeter is the Habitat Connectivity Envelope (HCE).
- 3. Within the HCE, outline the current extent of naturally occurring wetland and riparian habitat. Do not include habitats such as excavated ponds or reservoir induced fringe wetlands.
- 4. Outline the historical extent of wetland and riparian habitats (i.e., existing natural wetlands plus those that have been destroyed).
- Use your knowledge of the history of the area and evident land use change to identify where habitat losses have occurred. Additional research can be utilized to increase the accuracy of this estimate including consideration of floodplain maps, historical aerial photographs, soil maps, etc.
- 5. Calculate the area of existing and historical wetlands. Divide the area of existing wetland by the total amount of existing and historical wetland and riparian habitat, and determine the variable score using the guidelines below. Enter sub-variable score at the bottom of p.2 of the Habitat Connectivity data form.

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	A Reference Standard	Wetland losses are absent or negligible or there is no evidence to suggest the native landscape within the HCE historically contained other wetland habitats
<0.9 - 0.8	B Highly Functioning	More than 80% of historical wetland habitat area within the HCE is still present (less than 20% of habitat area lost).
<0.8 - 0.7	C Functioning	80 to 60% of historical wetland habitat area within the HCE is still present (20% to 40% of habitat area lost).
<0.7 - 0.6	D Functioning Impaired	Less than 60 to 25% of historical wetland habitat area within the HCE is still present (more than 40 to 75% of habitat area lost).
<0.6	F Non- functioning	Less than 25% of the historical wetland habitat area within the HCE still in existence (more than 70% of habitat lost).

Notes: The South Platte River flows through the HCE. Historically, the majority of the HCE was most likely a wide floodplain and riparian corridor with the river meandering through the corridor. The river has been channelized and the banks of the river have been riprapped and reinforced mostly eliminating any wetlands and riparian areas. The landscape surrounding the river has been changed to an urbanized setting with numerous buildings and impermeable surfaces such as parking lots and roads.

Variable 1: Habitat Connectivity p. 2

SV 1.2: Migration/Dispersal Barriers

This sub-variable is intended to rate the degree to which the AA has become isolated from existing neighboring wetland and riparian habitat by artificial barriers that inhibit migration or dispersal of organisms. On the aerial photograph, identify the manmade barriers within the HCE that intercede between the AA and surrounding wetlands and riparian areas, and identify them by type on the stressor list. Score this variable based on the barriers' impermeability to migration and dispersal and the amount of surrounding wetland/riparian habitat they affect.

Rules for Scoring:

- 1. On the aerial photo, outline **all** existing wetland and riparian habitat areas within the HCE. This includes naturally occurring habitats, as well as those purposefully created or induced by land use change.
- 2. Identify artificial barriers to dispersal and migration of organisms within the HCE that intercede between the AA and surrounding habitats. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.
- 3. Considering the composite effect of all of identified barriers to migration and dispersal (i.e., stressors), assign an overall variable score using the scoring guidelines.

	√	Stressors	Comments/description				
	Х	Major Highway	Interstate 70 crosses the northern portion of the HCE.				
ers		Secondary Highway					
barriers	Х	Tertiary Roadway	38th Street and bridge bisects the HCE.				
	Х	Railroad	Railroad bridge crosses over the river and bisects the HCE.				
artificial	Х	Bike Path	Colorado Front Range Trail and South Platte River Trail.				
l ij⊟	Х	Urban Development	Commercial areas and Denver Colliseum are in the HCE.				
= 		Agricultural Development					
	Х	Artificial Water Body	Stormwater detention area.				
Stressors	Х	Fence	Fences surround commercial buildings and parking areas.				
se.		Ditch or Aqueduct					
Stl		Aquatic Organism Barriers					
1							

Variable Score	Condition Grade	Scoring Guidelines				
1.0 - 0.9	A Reference Standard	No appreciable barriers exist between the AA and other wetland and riparian habitats in the HCE; or there are no other wetland and riparian areas in the HCE.				
<0.9 - 0.8 B Highly Functioning		Barriers impeding migration/dispersal between the AA and up to 33% of surrounding wetland/riparian habitat highly permeable and easily passed by most organisms. Examples could include gravel roads, minor levees, ditches or barbed-wire fences. Mor significant barriers (see "functioning category below) could affect migration to up to 10% of surrounding wetland/riparian habitat.				
<0.8 - 0.7	Barriers to migration and dispersal retard the ability of many organisms/propagule pass between the AA and up to 66% of wetland/riparian habitat. Passage of orga and propagules through such barriers is still possible, but it may be constrained to times of day, be slow, dangerous or require additional travel. Busy two-lane roads culverted areas, small to medium artificial water bodies or small earthen dams wo commonly rate a score in this range. More significant barriers (see "functioning in category below) could affect migration to up to 10% of surrounding wetland/riparia habitat.					
<0.7 - 0.6	D Functioning Impaired	Barriers to migration and dispersal preclude the passage of some types of organisms/propagules between the AA and up to 66% of surrounding wetland/riparian habitat. Travel of those animals which can potential negotiate the barrier are strongly restricted and may include a high chance of mortality. Up to 33% of surrounding wetland/riparian habitat could be functionally isolated from the AA.				
<0.6	F Non-functioning	AA is essentially isolated from surrounding wetland/riparian habitat by impermeable migration and dispersal barriers. An interstate highway or concrete-lined water conveyance canal are examples of barriers which would generally create functional isolation between the AA and wetland/riparian habitat in the HCE.				

SV 1.1 Score	0.60
SV 1.2 Score	0.58

Add SV 1.1 and 1.2 scores and divide by two to calculate variable score

Variable 1 Score

Variable 2: Contributing Area

The AA's Contributing Area is defined as the 250-meter-wide zone surrounding the perimeter of the AA. This variable is a measure of the capacity of that area to support characteristic functions of high quality wetland habitat. Depending on its condition, the contributing area can help maintain wetland condition or it can degrade it. Contributing Area condition is evaluated by considering the AA's Buffer and its Surrounding Land Use. Buffers are strips or patches of more-or-less natural upland and/or wetland habitat more than 5m wide. Buffers are contiguous with the AA boundary and they intercede between it and more intensively used lands. The AA Buffer is characterized with three sub-variables: Buffer Condition, Buffer Extent, and Average Buffer Width. The Surrounding Land Use Sub-variable considers changes within the Contributing Area that limit its capacity to support characteristic wetland functions. Many of the acute, on-site effects of land use change in the Contributing Area are specifically captured by Variables 3 - 8.

Rules for Scoring:

- 1. Delimit the Contributing Area on an aerial photograph as the zone within 250 meters of the outer boundary of the AA.
- 2. Evaluate and then rate the Buffer Condition sub-variable using the scoring guidelines. Record the score in the cell provided on the datasheet.
- 3. Indicate on the aerial photograph zones surrounding the AA which have ≥5m of buffer vegetation and those which do not.
- 4. Calculate the percentage of the AA which has a Buffer and record the value where indicated on the data sheet.
- 5. Rate the Buffer Extent Sub-variable using the scoring guidelines.
- 6.Determine the average Buffer width by drawing a line perpendicularly from the AA boundary to the outer extent of the buffer habitat. Measure line length and record its value on the data sheet. Repeat this process until a total of 8 lines have been sampled.
- 7. Calculate the average buffer width and record value on the data form. Then determine the sub-variable score using the scoring guidelines.
- 8. Score the Surrounding Land Use sub-variable by recording land use changes on the stressor list that affect the capacity of the landscape to support characteristic wetland functioning.
- 9. Enter the **lowest** of the three Buffer sub-variable scores along with the Surrounding Land Use Sub-variable score in the Contributing Area Variable scoring formula at the bottom of p. 2 of the data form. The Contributing Area Variable is the average of the two sub-variable scores.

SV 2.1 - Buffer Condition

0.62

SV 2.1 - Buffer Condition Score

Subvariable Score	Condition Grade	Buffer Condition Scoring Guidelines			
1.0 - 0.9	Reference Standard	Buffer vegetation is predominately native vegetation, human-caused disturbance of the substrate is not evident, and human visitation is minimal. Common examples: Wilderness areas, undeveloped forest and range lands.			
<0.9 - 0.8	Highly Functioning	Buffer vegetation may have a mixed native-nonnative composition, but characteristic structure and complexity remain. Soils are mostly undisturbed or have recovered from past human disturbance. Little or only low-impact human visitation. Buffers with higher levels of substrate disturbance may be included here if the buffer is still able to maintain predominately native vegetation. Common examples: Dispursed camping areas in national forests, common in wildland parks (e.g. State Parks) and open spaces.			
<0.8 - 0.7	Functioning	Buffer vegetation is substantially composed of non-native species. Vegetation structure may be somewhat altered, such as by brush clearing. Moderate substrate distrbance and compaction occurs, and small pockets of greater disturbance may exist. Common examples: City natural areas, mountain hay meadows.			
<0.7 - 0.6	Functioning Impaired	Buffer vegetation is substantially composed of non-native species and vegetation structure has been strongly altered by the complete removal of one or more strata. Soil disturbance and the intensity of human visitation are generally high. Common examples: Open lands around resource extraction sites (e.g., gravel mines), clear cut logging areas, ski slopes.			
<0.6	Non-functioning	Buffer is nearly or entirely absent.			

SV 2.2 - Buffer Extent

30 Percent of AA with Buffer

Subvariable Score	Condition Class	% Buffer Scoring Guidelines		
1.0 - 0.9	Reference Standard	90 - 100% of AA with Buffer		
<0.9 - 0.8	Highly Functioning	70-90% of AA with Buffer		
<0.8 - 0.7	Functioning	51-69% of AA with Buffer		
<0.7 - 0.6	Functioning Impaired	26-50% of AA with Buffer		
<0.6	Non-functionina	0-25% of AA with Buffer		

0.60 SV 2.2 - Buffer Extent

\/ - ·'	•		4	A	<i>(</i> , 0)					
		e 2: Contrib		Area	(p. 2)					
SV 2.	3 - <i>P</i>	Average Buffer V	Vidth		Record n	neas	ured buffer	widths in	the spaces below	and average.
Buffer		11 43	16	40	0	,				
Width		11 43	16 3	10 4	- 8 - 5	1 6	7	1 8	Avg. Buffer Wid	lth (m)
LIIIC #		1 2	3	7				-	Avg. Bullet Wic	iui (iii)
					Subvaria Score		Condition	Grade	Buffer Width Sc	oring Guidelines
	1	SV 2.3 - Aver	age Ru	ffer	1.0 - 0.		Reference	Standard	Average Buffer w	ridth is 190-250m
0.62		Width S	_		<0.9 - 0	.8	Highly Fun	ctioning	Average Buffer w	ridth is 101-189m
	_				<0.8 - 0	.7	Functio	ning	Average Buffer v	
					<0.7 - 0	.6	Functioning		_	width is 6-30m
<0.6 Non-functioning Average Buffer width is 0-5m							r width is 0-5m			
SV 2.	SV 2.4 - Surrounding Land Use									
	l cı	/24 Surrou	ndina							
0.6	۱۵۱	/ 2.4 - Surrou Land Use Sc	_		Catalog a landscap			iand use	changes in the su	ırrounding
	J -		U/ E	C						-
	X	Stressors Industrial/comm	orcial		ents/desc	_		ueeinoo	s, Concrete buss	singes
φ		Industriai/comm Urban	ercial						s, Concrete buss buting area.	SIIIUUSS.
Stressors = Land Use Changes	┢	Residential		i aikiilg	uicas, it	Jaus	, aans will	III OOHUI	builing alta.	
har		Rural								
О		Dryland Farming]							
Us		Intensive Agricu								
pu		Orchards or Nu								
. La	X	Livestock Grazi	0	20th ctr	oot roilro	nod.	and Arkins	Stroot I	acatad in contrib	uting area
S.		Transportation (Urban Parkland		38th street, railroad, and Arkins Street located in contributing area. Globeville Landing Park surrounds AA; vegetation is maintained.						
sor	<u> </u>	Dams/impoundr		Globevine Landing Fark Surrounds AA, Vegetation is maintained.					iiiitaiiieu.	
tres		Artificial Water I								
Ś		Physical Resource	Extraction							
		Biological Resource	Extraction							
<u> </u>	<u> </u>		1							
Varia Sco		Condition Grade					Scoring G	uidelin	es	
1.0 -	0.9	A Reference	No appre	ciable land	l use chang	e has	s been impos	ed Surrou	nding Landscape.	
		Standard	Complex	d use change has occurred in the Surrounding Landscape, but changes have minimal						
<0.9	- 0.8	В	effect on	the the lan	dscape's ca	apacit	ty to support	characteri	stic aquatic functioni or low intensity silvid	ing, either because
		Highly Functioning			,		imately less t	0	,	culture, or more
				nding Landscape has been subjected to a marked shift in land use, however, the land much of its capacity to support natural wetland function and it is not an overt source of						
<0.8	- 0.7	C Functioning							as dry-land farming,	
		, and only	corridors,	or modera	ate cattle gr	azing	would comm	only be pl	aced within this sco	ring range.
									een substantial incl	
		D							faces, bare soil, or c waters common. Su	
<0.7	- 0.6	Functioning	of the lan	d has beei	n greatly dir	ninish	ned but not to	tally exting	guished. Intensively	logged areas, low-
		Impaired		urban developments, some urban parklands and many cropping situations would nly rate a score within this range.						
<0	.6	F Non-functioning	ecologica	l stress or		abitats	s. Commerci		pped or is otherwise ments or highly urba	
		Buffer Score	Surro	unding						
		(Lowest score)		d Use						
				Ī	_					
	(0.6	0.6) ÷	2		= Var	iable	2 Score	0.60
			Ц	I						

Variable 3: Water Source

This variable is concerned with **up-gradient** hydrologic connectivity. It is a measure of impacts to the AA's water source, including the quantity and timing of water delivery, and the ability of source water to perform work such as sediment transport, erosion, soil pore flushing, etc. To score this variable, identify stressors that alter the source of water to the AA, and record their presence on the stressor list. Stressors can impact water source by depletion, augmentation, or alteration of inflow timing or hydrodynamics. This variable is designed to assess water quantity, power and timing, not water quality. Water quality will be evaluated in Variable 7.

Scoring rules:

- 1. Use the stressor list and knowledge of the watershed to catalog type-specific impairments of the AA's water source. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.
- 2. Considering the composite effect of stressors on the water source, rate the condition of this variable with the aid of the scoring guidelines.

√	Stressors	Comments/description
	Ditches or Drains (tile, etc.)	
	Dams	
	Diversions	
	Groundwater pumping	
	Draw-downs	
X	Culverts or Constrictions	Water passes through culvert upstream of AA.
	Point Source (urban, ind., ag.)	
X	Non-point Source	Stormwater drain.
	Increased Drainage Area	
X	Storm Drain/Urban Runoff	Unreliable water source.
X	Impermeable Surface Runoff	Unreliable water source.
	Irrigation Return Flows	
	Mining/Natural Gas Extraction	
	Transbasin Diversion	
	Actively Managed Hydrology	

Variable Score	Condition Grade	Depletion	Augmentation
1.0 - 0.9	A Reference Standard	Unnatural drawdown events minor, rare or non- existent, very slight uniform depletion, or trivial alteration of hydrodynamics.	Unnatural high-water events minor, rare or non- existent, slight uniform increase in amount of inflow, or trivial alteration of hydrodynamics.
<0.9 - 0.8	B Highly Functioning	Unnatural drawdown events occasional, short duration and/or mild; or uniform depletion up to 20%; or mild to moderate reduction of peak flows or capacity of water to perform work.	Occasional unnatural high-water events, short in duration and/or mild in intensity; or uniform augmentation up to 20%; or mild to moderate increase of peak flows or capacity of water to perform work.
<0.8 - 0.7	C Functioning	Unnatural drawdown events common and of mild to moderate intensity and/or duration; or uniform depletion up to 50%; or moderate to substantial reduction of peak flows or capacity of water to perform work.	Common occurrence of unnatural high-water events, of a mild to moderate intensity and/or duration; or uniform augmentation up to 50%; or moderate to substantial increase of peak flows or capacity of water to perform work.
<0.7 - 0.6	D Functioning Impaired	Unnatural drawdown events occur frequently with a moderate to high intensity and/or duration; or uniform depletion up to 75%; or substantial reduction of peak flows or capacity of water to perform work. Wetlands with actively managed or wholly artificial hydrology will usually score in this range or lower.	Common occurrence of unnatural high-water events, some of which may be severe in nature or exist for a substantial portion of the growing season; or uniform augmentation more than 50% or capacity of water to perform work. Wetlands with actively managed or wholly artificial hydrology will usually score in this range or lower.
<0.6	F Non- functioning	Water source diminished enough to threaten or extinguish wetland hydrology in the AA.	Frequency, duration or magnitude of unnaturally high-water great enough to change the fundamental characteristics of the wetland.

Variable 3 Score

Variable 4: Water Distribution

This variable is concerned with hydrologic connectivity within the AA. It is a measure of alteration to the spatial distribution of surface and groundwater within the AA. These alterations are manifested as local changes to the hydrograph and generally result from geomorphic modifications within the AA. To score this variable, identify stressors within the AA that alter flow patterns and impact the hydrograph of the AA, including localized increases or decreases to the depth or duration of the water table or surface water

Because the wetland's ability to distribute water in a characteristic fashion is fundamentally dependent on the condition of its water source, in most cases the Water Source variable score will define the upper limit Water Distribution score. For example, if the Water Source variable is rated at 0.85, the Water Distribution score will usually have the potential to attain a maximum score of 0.85. Additional stressors within or outside the lower end of the AA effecting water distribution (e.g., ditches and levees) will reduce the score from the maximum value.

Scoring rules:

- 1. Identify impacts to the natural distribution of water throughout the AA and catalog them in the stressor table.
- 2. Considering all of the stressors identified, assign an overall variable score using the scoring guidelines. In most cases, the Water Source variable score will set the upper limit for the Water Distribution score.

~	Stressors	Comments/description
	Alteration of Water Source	
	Ditches	
	Ponding/Impoundment	
	Culverts	
	Road Grades	
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Enlarged Channel	
×	Artificial Banks/Shoreline	Riprapped banks.
	Weirs	
	Dikes/Levees/Berms	
	Diversions	
	Sediment/Fill Accumulation	

Variable Score	Condition Grade	Non-riverine	Riverine
1.0 - 0.9	A Reference Standard	Little or no alteration has been made to the way in which water is distributed throughout the wetland. AA maintains a natural hydrologic regime.	Natural active floodplain areas flood on a normal recurrence interval. No evidence of alteration of flooding and subirrigation duration and intensity.
<0.9 - 0.8	hydrologic alteration; or more widespréad impacts result in less than a 2 in. (5 cm)		Channel-adjacent areas have occasional unnatural periods of drying or flooding; or uniform shift in the hydrograph less than typical root depth.
<0.8 - 0.7			In channel-adjacent area, periods of drying or flooding are common; or uniform shift in the hydrograph near root depth.
<0.7 - 0.6	D Functioning Impaired	33 to 66% of the AA is affected by in situ hydrologic alteration; or more widespread impacts result in a 6 in. (15 cm) or less change in mean growing season water table elevation. Water table behavior must still meet jurisdictional criteria to merit this rating.	Adjacent to the channel, unnatural periods of drying or flooding are the norm; or uniform shift in the hydrograph greater than root depth.
<0.6	F Non-functioning	More than 66% of the AA is affected by hydrologic alteration which changes the fundamental functioning of the wetland system, generally exhibited as a conversion to upland or deep water habitat.	Historical active floodplain areas are almost never wetted from overbank flooding, and/or groundwater infiltration is effectively cut off.

Variable 4 Score

Variable 5: Water Outflow

This variable is concerned with down-gradient hydrologic connectivity and the flow of water and water-borne materials and energy out of the AA. In particular it illustrates the degree to which the AA can support the functioning of down-gradient habitats. It is a measure of impacts that affect the hydrologic outflow of water including the passage of water through its normal low- and high-flow surface outlets, infiltration/groundwater recharge, and the energetic characteristics of water delivered to dependent habitats. In some cases, alteration of evapotranspiration rates may be significant enough of a factor to consider in scoring. Score this variable by identifying stressors that impact the means by which water is exported from the AA. To evaluate this variable focus on how water, energy and associated materials are exported out of the AA and their ability it support down-gradient habitats in a manner consistent with their HGM (regional) subclass.

Because the wetland's ability to export water and materials in a characteristic fashion is to a very large degree dependent the condition of its water source, as with the Water Distribution variable, in most cases the Water Source variable score will define the upper limit Water Outflow score.

Scoring rules:

- 1. Identify impacts to the natural outflow of water from the AA and catalog them in the stressor table.
- 2.Considering all of the stressors identified, assign an overall variable score using the scoring guidelines. Take in to account the cumulative effect of stressors on the wetland's ability to export water and water-borne materials. In most cases the Water Source variable will set the upper limit for the Water Outflow score.

✓	Stressors	Comments/description				
	Alteration of Water Source					
	Ditches					
	Dikes/Levees					
	Road Grades					
×	Culverts	Water flows through a culvert before entering South Platte River.				
	Diversions					
×	Constrictions	Water flows through a constricted area before entering South Platte River.				
	Channel Incision/Entrenchment					
×	Hardened/Engineered Channel	The sides and bottom of the stormwater area downstream of AA is concrete.				
×	Artificial Stream Banks	The sides of the staorm water area and South Platte River have artificial banks.				
	Weirs					
×	Confined Bridge Openings	Several bridges cross the South Platte River downstream of the AA.				
1						

Variable Score	Condition Grade	Scoring Guidelines			
1.0 - 0.9	A Reference Standard	Stressors have little to no effect on the magnitude, timing or hydrodynamics of the AA wate outflow regime.			
<0.9 - 0.8		High- or low-water outflows are mildly to moderately affected, but at intermediate ("normal") levels flow continues essentially unaltered in quantity or character.			
<0.8 - 0.7	C High- or low-water outflows are moderately affected, mild alteration of intermediate outflow occurs; or hydrodynamics moderately affected.				
<0.7 - 0.6	D Functioning Impaired	Outflow at all stages is moderately to highly impaired resulting in persistent flooding of portions of the AA or unnatural drainage; or outflow hydrodynamics severely disrupted.			
<0.6	F Non-functioning	The natural outflow regime is profoundly impaired. Down-gradient hydrologic connection severed or nearly so. Alterations may cause widespread unnatural persistent flooding or dewatering of the wetland system.			

Variable 5 Score

Variable 6: Geomorphology

This variable is a measure of the degree to which the geomorphic setting has been altered within the AA. Changes to the surface configuration and natural topography constitute stressors. Such stressors may be observed in the form of fill, excavation, dikes, sedimentation due to absence of flushing floods, etc. In riverine systems, geomorphic changes to the stream channel should be considered if the channel is within the AA (i.e., small is size). Alterations may involve the bed and bank (substrate embeddedness or morphological changes), stream instability, and stream channel reconfiguration. Geomorphic changes are usually ultimately manifested as changes to wetland surface hydrology and water relations with vegetation. Geomorphic alterations can also directly affect soil properties, such as near-surface texture, and the wetland chemical environment such as the redox state or nutrient composition in the rooting zone. In rating this variable, do not include these resultant effects of geomorphic change; rather focus on the physical impacts within the footprint of the alteration within the AA — For example, the width and depth of a ditch or the size of a levee within the AA would describe the extent of the stressors. The secondary effects of geomorphic change are addressed by other variables. All alterations to geomorphology should be evaluated including small-scale impacts such as pugging, hoof sheer, and sedimentation which can be significant but not immediately obvious.

Scoring Rules:

Identify impacts to geomorphological setting and topography within the AA and record them on the stressor checklist.
 Considering all of the stressors identified, assign an overall variable score using the scoring guidelines.

/		Stressors	Comments
		Dredging/Excavation/Mining	
		Fill, including dikes, road grades, etc.	
		Grading	
	=	Compaction	
	eneral	Plowing/Disking	
	en	Excessive Sedimentation	
	Ō	Dumping	
		Hoof Shear/Pugging	
		Aggregate or Mineral Mining	
×		Sand Accumulation	Sand and sediement have recently deposited within the AA.
		Channel Instability/Over Widening	
	nly	Excessive Bank Erosion	
	ō	Channelization	
	<u>s</u>	Reconfigured Stream Channels	
	ine.	Artificial Banks/Shoreline	
	Channels	Beaver Dam Removal	
	ਠ	Substrate Embeddedness	
		Lack or Excess of Woody Debris	

Variable Score	Condition Grade	Scoring Guidelines				
1.0 - 0.9	A Reference Standard	Topography essentially unaltered from the natural state, or alterations appear to have a minimal effect on wetland functioning and condition. Patch or microtopographic complexity may be slightly altered, but native plant communities are still supported.				
<0.9 - 0.8		Alterations to topography result in small but detectable changes to habitat conditions in some or all of the AA; or more severe impacts exist but affect less than 10% of the AA.				
<0.8 - 0.7 C Functioning		Changes to AA topography may be pervasive but generally mild to moderate in severity. May include patches of more significant habitat alteration; or more severe alterations affect up to 20 % of the AA.				
<0.7 - 0.6	D Functioning Impaired	At least one important surface type or landform has been eliminated or created; microtopography has been strongly impacted throughout most or all of the AA; or more severe alterations affect up to 50% of the AA. Evidence that widespread diminishment or alteration of native plant community exist due to physical habitat alterations. Most incidentally created wetland habitat such as that created by roadside ditches and the like would score in this range or lower.				
<0.6	F Non- functioning	Pervasive geomorphic alterations have caused a fundamental change in site character and functioning, commonly resulting in a conversion to upland or deepwater habitat.				

Variable 6 Score

Variable 7: Water and Soil Chemical Environment

This variable concerns the chemical environment of the soil and water media within the AA, including pollutants, water and soil characteristics. The origin of pollutants may be within or outside the AA. Score this variable by listing indicators of chemical stress in the AA. Consider point source and non-point sources of pollution, as well as mechanical or hydrologic changes that alter the chemical environment. Because water quality frequently cannot be inferred directly, the presence of stressors is often identified by the presence of indirect indicators. Five sub-variables are used to describe the Water and Soil Chemical Environment: Nutrient Enrichment/Eutrophication/Oxygen; Sedimentation/Turbidity; Toxic Contamination/PH; Temperature; and Soil Chemistry and Redox Potential. Utilization of web-based data mining tools is highly recommended to help inform and support variable scores.

Scoring rules:

- 1. Stressors are grouped into sub-variables which have a similar signature or set of causes.
- 2. Use the indicator list to identify each stressor impacting the chemical environment of the AA.
- 3. For each sub-variable, determine its score using the scoring guideline table provided on the second page of the scoring sheet. Scoring sub-variables is carried out in exactly the same way as normal variable scoring.
- -If the AA is part of a water body that is recognized as impaired or recommended for TMDL development for one of the factors, then score that sub-variable 0.65 or lower.
- 4. Transcribe sub-variable scores to the following variable scoring page and compute the sum.
- 5. The lowest sub-variable score sets the letter grade range. The composite of sub-variables influences the score within that range.

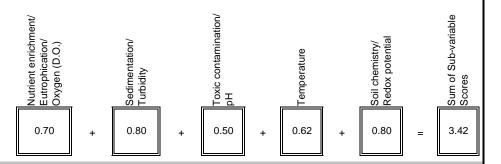
Sub-variable	Stressor Indicator	√	Comments		Sub-
	Livestock			\mathcal{N}	variable
SV 7.1	Agricultural Runoff			」 _	Score
Nutrient Enrichment/	Septic/Sewage				0.70
Eutrophication/	Excessive Algae or Aquatic Veg.	Х	Algae growth next to AA.	1	0.70
Oxygen (D.O.)	Cumulative Watershed NPS	Х	Vehicle fluids, herbicides, etc.] /	
Oxygen (D.O.)	CDPHE Impairment/TMDL List			1/	
	Excessive Erosion			1	
	Excessive Deposition			1 \	
	Fine Sediment Plumes			1 \	
SV 7.2	Agricultural Runoff			i f	0.80
Sedimentation/	Excessive Turbidity			1	0.80
Turbidity	Nearby Construction Site			1 /	
	Cumulative Watershed NPS	Х	Vehicle fluids, herbicides, etc.	1 /	
	CDPHE Impairment/TMDL List			1/	
	Recent Chemical Spills			┨	
	Nearby Industrial Sites	Х	Numerous nearby sites.	1\	
	Road Drainage/Runoff	Х	Numerous roads & parking lots.	1\	
	Livestock		g	1 \	
	Agricultural Runoff			1 \	
SV 7.3	Storm Water Runoff	Х	Stormwater detention area.	1 1	
Toxic contamination/	Fish/Wildlife Impacts		Grammater determien area.	1	0.50
На	Vegetation Impacts			1 /≒	
μ	Cumulative Watershed NPS	Х	Vehicle fluids, herbicides, etc.	1 /	
	Acid Mine Drainage	_^	Vernole Halas, Herbiolaes, etc.	1 /	
	Point Source Discharge			1/	
	CDPHE Impairment/TMDL List			1/	
	Metal staining on rocks and veg.			1	
	Excessive Temperature Regime	Х	Few trees in area.	\	
	Lack of Shading	X	No overhanging trees/shrubs.	1 \	
	Reservoir/Power Plant Discharge			1 1	
SV 7.4	Industrial Discharge			1	0.62
Temperature	Cumulative Watershed NPS	Х	Vehicle fluids, herbicides, etc.	┧	
	CDPHE Impairment/TMDL List		Tomas naido, norbiolado, etc.	1/	
	Unnatural Saturation/Desaturation			K	
SV 7.5	Mechanical Soil Disturbance			1	
Soil chemistry/	Dumping/introduced Soil	Х	Recent sedimentation.	1	0.80
Redox potential	CDPHE Impairment/TMDL List	Ë	. to control to different to the control to the con	┧╱╙	

Variable 7: Water and Soil Chemical Environment p.2

Sub-variable Scoring Guidelines

Variable Score	Condition Class	Scoring Guidelines		
1.0 - 0.9	A Reference Standard	Stress indicators not present or trivial.		
40.9 - 0.8 B Highly Functioning Stress indicators scarcely present and mild, or otherwise not occurring in of the AA.		Stress indicators scarcely present and mild, or otherwise not occurring in more than 10% of the AA.		
<0.8 - 0.7 C Functioning		Stress indicators present at mild to moderate levels, or otherwise not occurring in more than 33% of the AA.		
<0.7 - 0.6 D Functioning Impaired		Stress indicators present at moderate to high levels, or otherwise not occurring in more than 66% of the AA		
<0.6 F Non-functioning		Stress indicators strongly evident throughout the AA at levels which apparently alter the fundamental chemical environment of the wetland system		

Input each sub-variable score from p. 1 of the V7 data form and calculate the sum.



Use the table to score the Chemical Environment Variable circling the applicable scoring rules.

Variable Score	Condition Grade	Scoring Rules				
ocore		Single Factor		Composite Score		
1.0 - 0.9	A 1.0 - 0.9 Reference Standard No single factor scores < 0.9			The factor scores sum > 4.5		
<0.9 - 0.8	B Highly Functioning	Any single factor scores ≥ 0.8 but < 0.9		The factor scores sum >4.0 but ≤4.5		
<0.8 - 0.7	C Functioning	Any single factor scores ≥ 7.0 but < 0.8		The factor scores sum >3.5 but ≤ 4.0		
<0.7 - 0.6	D Functioning Impaired	Any single factor scores ≥ 0.6 but <0.7	х	The factor scores sum >3.0 but ≤3.5		
< 0.6	F Non- functioning	Any single factor scores < 0.6		The factor scores sum < 3.0		

Variable 7 Score

Variable 8: Vegetation Structure and Complexity

This variable is a measure of the condition of the wetland's vegetation relative to its native state. It particularly focuses on the wetland's ability to perform higher-order functions such as support of wildlife populations, and influence primary functions such as flood-flow attenuation, channel stabilization and sediment retention. Score this variable by listing stressors that have affected the structure, diversity, composition and cover of each vegetation stratum that would normally be present in the HGM (regional) subclass being assessed. For this variable, stressor severity is a measure of how much each vegetation stratum differs functionally from its natural condition or from the natural range of variability exhibited the HGM subclass or regional subclass. This variable has four sub-variables, each corresponding to a stratum of vegetation: Tree Canopy; Shrub Layer; Herbaceous Layer; and Aquatics.

Rules for Scoring:

- 1. Determine the number and types of vegetation layers present within the AA. Make a judgment as to whether additional layers were historically present using direct evidence such as stumps, root wads or historical photographs. Indirect evidence such as local knowledge and expert opinion can also be used in this determination.
- 2. Do not score vegetation layers that would not normally be present in the wetland type being assessed.
- 3. Estimate and record the current coverage of each vegetation layer at the top of the table.
- 4. Record the Reference Standard or expected percent coverage of each vegetation layer to create the sub-variable weighting factor. The condition of predominant vegetation layers has a greater influence on the variable score than do minor components.
- 5. Enter the percent cover values as decimals in the row of the stressor table labeled "Reference/expected Percent Cover of Layer". Note, percentages will often sum to more than 100% (1.0).
- 6. Determine the severity of stressors acting on each individual canopy layers, indicating their presence with checks in the appropriate boxes of the stressor table. The difference between the expected and observed stratum coverages is one measure of stratum alteration.
- 7. Determine the sub-variable score for each valid vegetation layer using the scoring guidelines on the second page of the scoring sheet. Enter each sub-variable score in the appropriate cell of the row labeled "Veg. Layer Sub-variable Score". If a stratum has been wholly removed score it as 0.5.
- 8. Multiply each layer's *Reference Percent Cover of Layer* score by its Veg. Layer Sub-variable scores and enter the products in the labled cells. These are the weighted sub-variable scores. Individually sum the *Reference Percent Cover of Layer* and *Weighted Sub-variables scores*.
- 9. Divide the sum of "Veg. Layer Sub-variable Scores" by the total coverage of all layers scored. This product is the Variable 8 score. Enter this number in the labeled box at the bottom of this page.

		Vegetatio	n Layers	3	
Current % Coverage of					
Layer	0	0	98	0	
Stressor	Tree	Shrub	Herb	Aquatic	Comments
Brush Cutting/Shrub Removal	Х				Girdling of some trees.
Dewatering					
Excessive Herbivory					
Exotic/Invasive spp.					
Herbicide					
Livestock Grazing					
Loss of Zonation/Homogenization			Х		Loss of diversity.
Mowing/Haying					
Noxious Weeds					
Over Saturation					
Tree Harvest					
DIFFERENCE BETWEEN CURRENT COVERAGE AND REFERENCE/EXPECTED	10	15	28	0	
Reference/Expected % Cover of Layer	10 +	15 +	70 +	0 X	95
Veg. Layer Sub- variable Score	0.6	0.6	0.75		See sub-variable scoring guidelines on following page
	II	II	II	II	
Weighted Sub-variable Score	6.00 +	9.00 +	52.50 +		= 67.5
					Variable 8 Score

Variable 8: Vegetation Structure and Complexity p. 2

Sub-variable 8 Scoring Guidelines:
Based on the list of stressors identified above, rate the severity of their cumulative effect on vegetation structure and complexity for each vegetation layer.

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	A Reference Standard	Stressors not present or with an intensity low enough as to not detectably affect the structure, diversity or composition of the vegetation layer.
<0.9 - 0.8	B Highly Functioning	Stressors present at intensity levels sufficient to cause detectable, but minor, changes in layer composition. Stress related change should generally be less than 10% for any given attribute (e.g., 10% cover of invasive, 10% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as high as 33% for a given attribute if stressors are confined to patches comprising less than 10% of the wetland.
<0.8 - 0.7	C Functioning	Stressors present with enough intensity to cause significant changes in the character of vegetation, including alteration of layer coverage, structural complexity and species composition. The vegetation layer retains its essential character though. AA's with a high proportion of non-native grasses will commonly fall in this class. Stress related change should generally be less than 33% for any given attribute (e.g., 33% cover of invasive, 33% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as much as 66% for a given attribute if stressors are confined to patches comprising less than 25% of the wetland.
<0.7 - 0.6	D Functioning Impaired	Stressor intensity severe enough to cause profound changes to the fundamental character of the vegetation layer. Stress-related change should generally be less than 66% for any given attribute (e.g., 66% cover of invasive, 66% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as much as 80% of a given attribute if stressors are confined to patches comprising less than 50% of the wetland.
<0.6	F Non- functioning	Vegetation layer has been completely removed or altered to the extent that is no longer comparable to the natural structure, diversity and composition.

FACWet Score Card

Scoring Procedure:

- 1. Transcribe variable scores from each variable data sheet to the corresponding cell in the variable score table.
- 2. In each Functional Capacity Index (FCI) equation, enter the corresponding variable scores in the equation cells. Do not enter values in the crossed cells lacking labels.
- 3. Add the variable scores to calculate the total functional points achieved for each function.
- 4. Divide the total functional points achieved by the functional points possible. The typical number of total points possible is provided, however, if a variable is added or subtracted to FCI equation the total possible points must be adjusted.
- 5. Calculate the Composite FCI, by adding the FCI scores and dividing by the total number of functions scored (usually 7).
- 6. If scoring is done directly in the Excel spreadsheet, all values will be transferred and calculated automatically.

VARIA	BLE SCORE	TABLE		_
Buffer & Landscape Context	Variable 1:	Habitat Connectivity (Connect)	0.55	
Buffi Lands Con	Variable 2:	Contributing Area (CA)	0.60	
33	Variable 3:	Water Source (Source)	0.70	
Hydrology	Variable 4:	Water Distribution (Dist)	0.80	
Í.	Variable 5:	Water Outflow (Outflow)	0.69	
Siotic	Variable 6:	Geomorphology (Geom)	0.70	
Abiotic and Biotic Habitat	Variable 7:	Chemical Environment (Chem)	0.65	
Abioti P	Variable 8:	Vegetation Structure and Complexity (Veg)	0.71	
Function	al Capacity	Indices		2
Function 1 -	Support of Cha	Total aracteristic Wildlife Habitat Functional		FCI
V1 _{connect}	+ V2 _{CA} +			FCI
0.55	+ 0.60 +	1.42 + + + = 2.57	÷ 4 =	0.64
Function 2 -	- Support of Cha	aracteristic Fish/aquatic Habitat		
(3 x V3 _{source})		$(2 \times V5_{\text{outflow}}) + V6_{\text{geom}} + V7_{\text{chem}}$		
2.10	+ 1.60 +		÷ 9 =	0.71
Function 3 -	Flood Attenuat	ion		
V2 _{CA}	+ (2 x V3 _{source}) +	$(2 \times V4_{dist})$ + $(2 \times V5_{outflow})$ + $V6_{geom}$ + $V8_{veg}$	•	
0.60	+ 1.40 +	1.60 + 1.38 + 0.70 + 0.71 = 6.39	÷ 9 =	0.71
Function 4	Short- and Lor	g-term Water Storage		
V3 _{source}	+ (2 x V4 _{dist}) +	(2 x V5 _{outflow}) V6 _{geom}		
0.70	+ 1.60 +	1.38 + 0.70 + + = 4.38	÷ 6 =	0.73
Function 5 -	Nutrient/Toxic	ant Removal		
(2 x V2 _{CA})	+ (2 x V4 _{dist}) +	V6 _{geom} V7 _{chem}		
1.20	+ 1.60 +	0.70 + 0.65 + + = 4.15	÷ 6 =	0.69
Function 6	Sediment Rete	ntion/Shoreline Stabilization		
V2 _{CA}	+ (2 x V6 _{geom}) +	(2 x V8 _{veg})		
0.60	+ 1.40 +	1.42 + + + + = 3.42	÷ 5 =	0.68
Function 7	Production Ex	port/Food Chain Support		
V1 _{connect}	+ (2 x V5 _{outflow}) +	V6 _{geom} + V7 _{chem} + (2 x V8 _{veg})	•	
0.55	+ 1.38 +	0.70 + 0.65 + 1.42 + = 4.70	÷ 7 =	0.67
		Sum of Individual FCI	Scores	4.84
		Divide by the Number of Function	ons Scored	÷ 7
				<u> </u>

Composite FCI Score

0.69

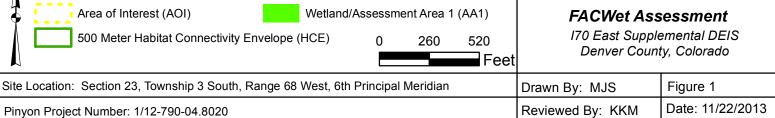
Note: The following FACWet form was completed for a wetland delineated

on November 18, 2013. To be consistent with the previous

delineation's numbering structure, Globeville Outfall AA-1, as shown on the FACWet form, was assigned WET-Culv02 in the body of this $\,$

report.











FACWet Assessment

170 East Supplemental DEIS Denver County, Colorado

Site Location: Section 23, Township 3 South, Range 68 West, 6th Principal Meridian

Pinyon Project Number: 1/12-790-04.8020

Drawn By: MJS

Reviewed By: KKM

Date: 11/22/2013

Figure 2

Attachment N – Appendix E USACE Jurisdictional Determination



DEPARTMENT OF THE ARMY

CORPS OF ENGINEERS, OMAHA DISTRICT
DENVER REGULATORY OFFICE, 9307 SOUTH WADSWORTH BOULEVARD
LITTLETON, COLORADO 80128-6901

July 9, 2013

Mr. Aaron Eilers Colorado Dept. of Transportation Region 6 2000 South Holly Street Denver, CO 80222

RE:

I-70 East, I-25 to Tower Road - Approved Jurisdictional Determination

Corps File No. NWO-2013-1163-DEN

Dear Mr. Eilers:

The above referenced project area has been reviewed in accordance with Section 404 of the Clean Water Act under which the U.S. Army Corps of Engineers regulates the discharge of dredged and fill material, and any excavation activity associated with a dredge and fill project in waters of the United States. Waters of the U.S. includes ephemeral, intermittent and perennial streams, their surface connected wetlands and adjacent wetlands, certain lakes, ponds, drainage ditches and irrigation ditches that have a nexus to interstate commerce.

An approved jurisdictional determination (JD) has been completed for aquatic resources associated with the above referenced project area. The JDs is attached to this letter. If you are not in agreement with the JD decisions, you may request an administrative appeal under regulation 33 CFR 331, by using the attached Appeal Form and Administrative Appeal Process form. The request for appeal must be received within 60 days from the date of this letter. If you would like more information on the jurisdictional appeal process, contact this office. It is not necessary to submit a Request for Appeal if you do not object to the JD.

Jurisdictional Waters

The South Platte River, with associated wetlands, and Sand Creek, with associated wetlands, are all known as "Waters of the United States" and are regulated under Section 404 of the Clean Water Act. If any work associated with this project requires the placement of dredged or fill material, and any excavation associated with a dredged or fill project, either temporary or permanent, in these aquatic resources, this office should be notified by a proponent of the project for Department of the Army permits or changes in permit requirements pursuant to Section 404 of the Clean Water Act.

Non-Jurisdictional Waters

Reference is made to the November 13, 1986 Federal Register (Page 41217), Part 328 (a) Non-tidal drainage and irrigation ditches excavated on dry land, and (c) artificial lakes or ponds created by excavating and/or diking dry land to collect and retain water and which are used exclusively for such purposes as stock watering, irrigation, settling basins, or rice growing. The Corps of Engineers generally does not consider these types of aquatic resources waters of the U.S. except on a case-by-case basis. In this case, there is no relatively permanent flow from the detention basins and roadside ditches in the review area to a waters of the US. As such, the following detention basins and roadside ditches were

determined to be preamble waters and are not considered jurisdictional: WET279-01, WET279-02, WET280-01 – WET280-08, WET281-01 – WET281-07, WET282-01, WET284-01, and WET285-01 – WET285-06.

Based on the information provided, a Department of the Army (DA) Permit will not be required for the work in the above referenced detention basins and roadside ditches. Although a DA Permit will not be required for these areas, this does not eliminate the requirement that other applicable federal, state, and local permits be obtained as needed.

This JD is valid for a period of five years from the date of this letter, unless new information warrants revisions of the JDs before the expiration date, or unless the Corps has identified, after a possible public notice and comment, that specific geographic areas with rapidly changing environmental conditions merit re-verification on a more frequent basis.

The Omaha District, Regulatory Branch is committed to providing quality and timely service to our customers. In an effort to improve customer service, please take a moment to complete our Customer Service Survey found on our website at http://per2.nwp.usace.army.mil/survey.html. If you do not have Internet access, you may call and request a paper copy of the survey that you can complete and return to us by mail or fax. (Completing the survey is a voluntary action)

If there are any questions call Matt Montgomery of my office at 303-979-4120 and reference Corps File No. NWO-2013-1163-DEN.

Sincerely,

J. Scott Franklin

Chief, Denver Regulatory Office

. Scott Laux

APPROVED JURISDICTIONAL DETERMINATION FORM U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

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REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): July 1, 2013

ь.	DIORDIAN APPIAR	THE PLANTAGES	A NEW ATTENDED.
B.	DISTRICT OFFICE.	FILE NAME.	AND NUMBER:

	Denver Regulatory Office, I-70 East, I-25 to Tower Road, NWO-2013-1163-DEN
C.	PROJECT LOCATION AND BACKGROUND INFORMATION: State: CO County/parish/borough: Denver City: Denver Center coordinates of site (lat/long in degree decimal format): Lat.39.7749 N; Long104.8488 W Name of nearest waterbody: NA Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: NA Name of watershed or Hydrologic Unit Code (HUC):10190003 Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request. Check if other sites (e.g., offsite mitigation sites, disposal sites, etc) are associated with this action and are recorded on a different JD form.
D.	REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY): Office (Desk) Determination. Date: July 1, 2013 Field Determination. Date(s):
	CTION II: SUMMARY OF FINDINGS RHA SECTION 10 DETERMINATION OF JURISDICTION.
revi	ere Are no "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the iew area. [Required] Waters subject to the ebb and flow of the tide. Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain: CWA SECTION 404 DETERMINATION OF JURISDICTION.
The	ere Are no "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [Required]
	1. Waters of the U.S. a. Indicate presence of waters of U.S. in review area (check all that apply): TNWs, including territorial seas Wetlands adjacent to TNWs Relatively permanent waters² (RPWs) that flow directly or indirectly into TNWs Non-RPWs that flow directly or indirectly into TNWs Wetlands directly abutting RPWs that flow directly or indirectly into TNWs Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs Impoundments of jurisdictional waters Isolated (interstate or intrastate) waters, including isolated wetlands
	b. Identify (estimate) size of waters of the U.S. in the review area: Non-wetland waters: linear feet: width (ft) and/or acres. Wetlands: acres.
	c. Limits (boundaries) of jurisdiction based on: Pick List Elevation of established OHWM (if known):
	2. Non-regulated waters/wetlands (check if applicable): ³ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain: The following detention basins and roadside ditches were determined to be preamble waters and are not considered jurisdictional: WET279-01, WET279-02, WET280-01 – WET280-08, WET281-01 – WET281-07, WET282-01, WET284-01,

and WET285-01 - WET285-06. See reference below in Section III.F.

¹ Boxes checked below shall be supported by completing the appropriate sections in Section III below.
² For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).

Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

TNW 1.

Identify TNW:

Summarize rationale supporting determination:

Wetland adjacent to TNW

Summarize rationale supporting conclusion that wetland is "adjacent":

CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under Rapanos have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III,D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

Characteristics of non-TNWs that flow directly or indirectly into TNW

General Area Conditions: Watershed size: Pick List Pick List Drainage area: Average annual rainfall: inches

inches

Average annual snowfall:

(ii) Physical Characteristics:

(a) Relationship with TNW:

Tributary flows directly into TNW.

Tributary flows through Pick List tributaries before entering TNW.

Project waters are Pick List river miles from TNW.

Project waters are Pick List river miles from RPW.
Project waters are Pick List aerial (straight) miles from TNW.

Project waters are Pick List aerial (straight) miles from RPW.

Project waters cross or serve as state boundaries. Explain:

Identify flow route to TNW5:

Tributary stream order, if known:

⁴ Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

	(b)	General Tributary Characteristics (check all that apply): Tributary is: Natural Artificial (man-made). Explain: Manipulated (man-altered). Explain:
		Tributary properties with respect to top of bank (estimate): Average width: feet Average depth: feet Average side slopes: Pick List.
		Primary tributary substrate composition (check all that apply): Silts Concrete Cobbles Gravel Muck Bedrock Vegetation. Type/% cover: Other. Explain:
		Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: Presence of run/riffle/pool complexes. Explain: Tributary geometry: Pick List Tributary gradient (approximate average slope): %
	(c)	Flow: Tributary provides for: Pick List Estimate average number of flow events in review area/year: Pick List Describe flow regime: Other information on duration and volume:
		Surface flow is: Pick List. Characteristics:
		Subsurface flow: Pick List. Explain findings: Dye (or other) test performed:
		Tributary has (check all that apply): Bed and banks OHWM ⁶ (check all indicators that apply): clear, natural line impressed on the bank changes in the character of soil shelving vegetation matted down, bent, or absent leaf litter disturbed or washed away sediment deposition water staining other (list): Discontinuous OHWM. ⁷ Explain:
		If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply): High Tide Line indicated by.
(iii)	Cha	emical Characteristics: racterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.) Explain: atify specific pollutants, if known:
(iv)	Biol	logical Characteristics. Channel supports (check all that apply): Riparian corridor. Characteristics (type, average width): Wetland fringe. Characteristics:

⁶A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.

⁷Ibid.

			Habitat for: Federally Listed species Fish/spawn areas. Expla Other environmentally-s Aquatic/wildlife diversit	in findings: sensitive species. Explain fin	dings: .	
2.	Cha	aract	teristics of wetlands adjacen	it to non-TNW that flow dir	ectly or indirectly into TNW	,
	(i)		ysical Characteristics: <u>General Wetland Characteri</u> Properties: Wetland size: acre Wetland type. Explain: Wetland quality. Explai Project wetlands cross or se	rs ·	uin: .	
		(b)	General Flow Relationship Flow is: Pick List. Explain:			
			Surface flow is: Pick List Characteristics:			
•			Subsurface flow: Pick List. Dye (or other) test per		·.	
		(c)	Wetland Adjacency Determ Directly abutting Not directly abutting Discrete wetland hy Ecological connection Separated by berm/b	drologic connection. Explain	d .	
		(d)	Flow is from: Pick List.			
	(ii)	Cha	emical Characteristics: aracterize wetland system (e.g characteristics; etc.). Explai ntify specific pollutants, if kno	in: .	oil film on surface; water qua	ality; general watershed
	(iii)	Bio	Riparian buffer. Characterist Vegetation type/percent cov Habitat for: Federally Listed species. Fish/spawn areas. Explair Other environmentally-s Aquatic/wildlife diversit	stics (type, average width): er. Explain: Explain findings: in findings: ensitive species. Explain find		,
3.	Cha	Ali	teristics of all wetlands adjact wetland(s) being considered in the proximately () acres in the control of the		ck List	
		For	each wetland, specify the foll	lowing:		
			Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)
			Summarize overall highories	al chamical and physical fun-	rtions heing nerformed	

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the Rapanos Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

- 1. Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:
- 2. Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:
- 3. Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1.	TNWs and Adjacent Wetlands. Check all that apply and provide size estimates in review area: TNWs: linear feet width (ft), Or, acres. Wetlands adjacent to TNWs: acres.
2.	RPWs that flow directly or indirectly into TNWs. Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:
	Provide estimates for jurisdictional waters in the review area (check all that apply): Tributary waters: linear feet width (ft). Other non-wetland waters: acres. Identify type(s) of waters:
3.	Non-RPWs ⁸ that flow directly or indirectly into TNWs. Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.
	Provide estimates for jurisdictional waters within the review area (check all that apply): Tributary waters: linear feet width (ft). Other non-wetland waters: acres. Identify type(s) of waters: .

5

⁸See Footnote # 3.

	4.	Wetlands directly abutting an RPW that flow directly or indirectly into TNWs. Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands. Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:
		Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above, Provide rationale indicating that wetland is directly abutting an RPW:
		Provide acreage estimates for jurisdictional wetlands in the review area: acres.
	5.	Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs. Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.
		Provide acreage estimates for jurisdictional wetlands in the review area: acres.
	6.	Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs. Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.
		Provide estimates for jurisdictional wetlands in the review area: acres.
	7.	Impoundments of jurisdictional waters. As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional. Demonstrate that impoundment was created from "waters of the U.S.," or Demonstrate that water meets the criteria for one of the categories presented above (1-6), or Demonstrate that water is isolated with a nexus to commerce (see E below).
E.	DE SUC	DLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, GRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY CH WATERS (CHECK ALL THAT APPLY): 10 which are or could be used by interstate or foreign travelers for recreational or other purposes. from which fish or shellfish are or could be taken and sold in interstate or foreign commerce, which are or could be used for industrial purposes by industries in interstate commerce. Interstate isolated waters. Explain: Other factors. Explain:
	Ide	ntify water body and summarize rationale supporting determination:
		vide estimates for jurisdictional waters in the review area (check all that apply): Tributary waters: linear feet width (ft). Other non-wetland waters: acres. Identify type(s) of waters: . Wetlands: acres.
F.	D D Non	N-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY): If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements. Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce. Prior to the Jan 2001 Supreme Court decision in "SWANCC," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR). Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: Other: (explain, if not covered above): Reference is made to the November 13, 1986 Federal Register (Page 41217), Part 328 (a) actidal drainage and irrigation ditches excavated on dry land, and (c) artificial lakes or ponds created by excavating and/or diking dry to collect and retain water and which are used exclusively for such purposes as stock watering, irrigation, settling basins, or rice
		The state of the s

⁹ To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

¹⁰ Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos.

growing. The Corps of Engineers generally does not consider these types of aquatic resources waters of the U.S. except on a case-by-case basis. In this case, there is no relatively permanent flow from the detention basins and roadside ditches to a waters of the US. As such, these detention basins and roadside ditches are not considered jurisdictional.

fac	ovide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR tors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional gment (check all that apply): Non-wetland waters (i.e., rivers, streams): linear feet width (ft). Lakes/ponds: acres. Other non-wetland waters: acres. List type of aquatic resource: . Wetlands: acres.
	wide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such nding is required for jurisdiction (check all that apply): Non-wetland waters (i.e., rivers, streams): linear feet, width (ft). Lakes/ponds: acres. Other non-wetland waters: acres. List type of aquatic resource: Wetlands: acres.
SECTIO	ON IV: DATA SOURCES.
	PORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked requested, appropriately reference sources below): Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: Data sheets prepared/submitted by or on behalf of the applicant/consultant. Office concurs with data sheets/delineation report. Data sheets prepared by the Corps: Corps navigable waters' study: U.S. Geological Survey Hydrologic Atlas: USGS NHD data. USGS 8 and 12 digit HUC maps. U.S. Geological Survey map(s). Cite scale & quad name: USDA Natural Resources Conservation Service Soil Survey. Citation: National wetlands inventory map(s). Cite name: State/Local wetland inventory map(s): FEMA/FIRM maps: 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929) Photographs: Aerial (Name & Date): or Other (Name & Date): Previous determination(s). File no. and date of response letter: Applicable/supporting case law: Applicable/supporting scientific literature: Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD:

APPROVED JURISDICTIONAL DETERMINATION FORM U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SEO A.	CTION I: BACKGROUND INFORMATION REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): July 1, 2013
В.	DISTRICT OFFICE, FILE NAME, AND NUMBER:
	Denver Regulatory Office, I-70 East, I-25 to Tower Road, NWO-2013-1163-DEN
C.	PROJECT LOCATION AND BACKGROUND INFORMATION: Sand Creek State: CO County/parish/borough: Denver City: Denver Center coordinates of site (lat/long in degree decimal format): Lat. 39,7792 N; Long104,9778 W Name of nearest waterbody: Sand Creek Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: South Platte River Name of watershed or Hydrologic Unit Code (HUC): 10190003 Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request. Check if other sites (e.g., offsite mitigation sites, disposal sites, etc) are associated with this action and are recorded on a different JD form.
D.	REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY): Office (Desk) Determination. Date: July 1, 2013 Field Determination. Date(s):
SEG A.	CTION II: SUMMARY OF FINDINGS RHA SECTION 10 DETERMINATION OF JURISDICTION.
	ere Are not "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the iew area. [Required] Waters subject to the ebb and flow of the tide. Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce Explain:
B.	CWA SECTION 404 DETERMINATION OF JURISDICTION.
The	ere Are "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [Required]
	1. Waters of the U.S. a. Indicate presence of waters of U.S. in review area (check all that apply): TNWs, including territorial seas Wetlands adjacent to TNWs Relatively permanent waters ² (RPWs) that flow directly or indirectly into TNWs Non-RPWs that flow directly or indirectly into TNWs Wetlands directly abutting RPWs that flow directly or indirectly into TNWs Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs Impoundments of jurisdictional waters Isolated (interstate or intrastate) waters, including isolated wetlands
•	b. Identify (estimate) size of waters of the U.S. in the review area:

Elevation of established OHWM (if known):

Non-wetland waters: Sand Creek linear feet: 2,500

Wetlands: CDOT Wtlnd Mit. Site and WET278-01 - WET278-12, 0.951 acres.

Non-regulated waters/wetlands (check if applicable):3 Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain:

¹ Boxes checked below shall be supported by completing the appropriate sections in Section III below.

c. Limits (boundaries) of jurisdiction based on: 1987 Delineation Manual

² For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).

Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW

Identify TNW:

Summarize rationale supporting determination:

2. Wetland adjacent to TNW

Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions:

Watershed size: 2500 square miles
Drainage area: Pick List
Average annual rainfall: 14 inches
Average annual snowfall: 40 inches

(ii) Physical Characteristics:

(a) Relationship with TNW:

☐ Tributary flows directly into TNW. ☐ Tributary flows through ¼ tributaries before entering TNW.

Project waters are 2-5 river miles from TNW.

Project waters are 1 (or less) river miles from RPW.

Project waters are 2-5 aerial (straight) miles from TNW.

Project waters are 1 (or less) aerial (straight) miles from RPW.

Project waters cross or serve as state boundaries. Explain:

Identify flow route to TNW⁵: Flows directly into South Platte River.

Tributary stream order, if known:

⁴ Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and crosional features generally and in the arid West.

⁵ Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

	(b)	General Tributary Characteristics (check all that apply): Tributary is:
		Tributary properties with respect to top of bank (estimate): Average width: feet Average depth: feet Average side slopes: [31].
		Primary tributary substrate composition (check all that apply): Silts Sands Concrete Cobbles Gravel Muck Bedrock Vegetation. Type/% cover: Other. Explain:
		Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: sloughing banks. Presence of run/riffle/pool complexes. Explain: Tributary geometry: Relatively straight Tributary gradient (approximate average slope): 1 %
	(c)	Flow: Tributary provides for: Perennial flow Estimate average number of flow events in review area/year: I Describe flow regime: flows year round. Other information on duration and volume:
		Surface flow is: Confined. Characteristics: flows confined to channel.
		Subsurface flow: Unknown. Explain findings: . Dye (or other) test performed: .
		Tributary has (check all that apply): Bed and banks OHWM ⁶ (check all indicators that apply): clear, natural line impressed on the bank changes in the character of soil shelving vegetation matted down, bent, or absent leaf litter disturbed or washed away sediment deposition water staining other (list): Discontinuous OHWM. Explain:
		If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply): High Tide Line indicated by:
(iii)	Che Cha	emical Characteristics: racterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.) Explain: water color is generally clear, turning silty during precipitation events. Identify specific pollutants, if known: possible asphalt sealcoating, oil and fuel from adjacent parking lots. Adjacent areas are heavily industrialized.

⁶A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.

⁷Ibid.

	(iv)	\boxtimes	Riparian corridor. Chara Wetland fringe. Characte Habitat for: Federally Listed spec Fish/spawn areas. Exp	eristics: ies. Explain findings: plain findings; y-sensitive species. Explai	dth): riparian corridor is sparse.	
2.	Cha	ıract	eristics of wetlands adjac	ent to non-TNW that flo	w directly or indirectly into TNV	7
	(i)			res in:PEM.	fluence of urban conditions. Explain:	
		(b)	Surface flow is: Overlan Characteristics: Wetle uplands. Subsurface flow: Unknow	Explain: flows from weth dishectflow ands range from approximate. Explain findings:	and to Sand Creek during precipite	
		(c)	☐ Directly abutting ☐ Not directly abutting ☐ Discrete wetland	rmination with Non-TNW; hydrologic connection. Excition. Explain: See Section	splain: .	
		(d)	Flow is from: Wetland to	iver miles from TNW. rial (straight) miles from T o navigable waters.	NW. the 20 - 50-year floodplain.	
	(ii)		characteristics; etc.). Exp	olain: Unknown, Likely closs, if known: possible asph	rown, oil film on surface; water que ear to silty during precipitation eve alt scalcoating, oil and fuel from ac	nts.
	(iii)	Biol	Riparian buffer. Characte Vegetation type/percent of Habitat for: Federally Listed speci Fish/spawn areas. Exp	es. Explain findings:	h): n findings:	
3.	Cha	All	wetland(s) being considere	jacent to the tributary (if d in the cumulative analys total are being considered		
		For	each wetland, specify the f	following:		
			Directly abuts? (Y/N) WET278-01	Size (in acres) 0.17	Directly abuts? (Y/N)	Size (in acres)

Summarize overall biological, chemical and physical functions being performed: The biological function may provide habitat for micro and macro invertebrates including annelids, arthropods, arachnids and amphibians, which may be a food source for birds, rodents, small carnivorous mammals and reptiles. The vegetation may provide cover and a food source for certain birds and other wildlife associated with the high plains and urban development. Chemical function is most likely low, however due to likely contaminated adjacent stormwater runoff, the wetlands act as detention facilities to improve surface/ground water quality and flood detention prior to entering Sand Creek.

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the Rapanos Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

- 1. Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:
- 2. Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:
- 3. Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

Hydrological, Biological, Chemical Nexus: Although the quality of the adjacent wetlands may be poor to fair, the adjacent wetlands perform erosion control measures, flood control and flood attenuation functions, as well as sediment mitigation by holding back sediment runoff that would eventually enter Sand Creek. Wetland plants have the ability to uptake or detain chemicals such as nitrates and phosphates which naturally erode from the soil, and industrial contaminants, such as asphalt sealcoating, oil and fuel. This uptake and detention of chemicals by wetland vegetation improves downstream water quality by preventing the chemicals from continuing downstream. These wetlands within the watershed incrementally and cumulatively increase the water quality of downstream tributaries, which in this case includes the South Platte River, a TNW.

Based on the above information, Sand Creek and these adjacent wetlands have a significant nexus to the nearest TNW, the South Platte River.

D.	DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL
	THAT APPLY):

1.	TNWs and	Adjacent Wetlands.	Check all that:	apply and provide	size estimates i	n review area:
	TNWs:	linear feet	width (ft), Or,	acres.		
	Wetland	s adjacent to TNWs:	acres.			

2.	RPWs that flow directly or indirectly into TNWs. Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: USGS flow gauges on Sand Creek show perennial flow.
	Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:
	Provide estimates for jurisdictional waters in the review area (check all that apply): Tributary waters: linear fee width (ft). Other non-wetland waters: acres. Identify type(s) of waters: .
3.	Non-RPWs ⁸ that flow directly or indirectly into TNWs. Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.
	Provide estimates for jurisdictional waters within the review area (check all that apply): Tributary waters: linear feet width (ft). Other non-wetland waters: acres. Identify type(s) of waters:
4.	Wetlands directly abutting an RPW that flow directly or indirectly into TNWs. Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands. Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: Wetlands WET278-02 – WET278-12 are fringe to OHWM of Sand Creek.
	Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:
	Provide acreage estimates for jurisdictional wetlands in the review area: 0.761 acres.
5.	Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs. Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. CDOT Wilnd Mit. Site and WET278-01
	Provide acreage estimates for jurisdictional wetlands in the review area: 0.19 acres.
6.	Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs. Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.
	Provide estimates for jurisdictional wetlands in the review area: acres.
7.	Impoundments of jurisdictional waters. As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional. Demonstrate that impoundment was created from "waters of the U.S.," or Demonstrate that water meets the criteria for one of the categories presented above (1-6), or Demonstrate that water is isolated with a nexus to commerce (see E below).
DE SUC	PLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, GRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY CH WATERS (CHECK ALL THAT APPLY): 10 which are or could be used by interstate or foreign travelers for recreational or other purposes. from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.

E.

 ⁸See Footnote # 3.
 9 To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.
 10 Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos.

	which are or could be used for industrial purposes by industries in interstate commerce. Interstate isolated waters. Explain: Other factors. Explain:
	Identify water body and summarize rationale supporting determination:
	Provide estimates for jurisdictional waters in the review area (check all that apply): Tributary waters: linear feet width (ft). Other non-wetland waters: acres. Identify type(s) of waters: . Wetlands: acres.
F.	NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY): If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements. Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce. Prior to the Jan 2001 Supreme Court decision in "SWANCC," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR). Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: Other: (explain, if not covered above):
	Provide acreage estimates for non-jurisdictional waters in the review area, where the <u>sole</u> potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply): Non-wetland waters (i.e., rivers, streams): linear feet width (ft). Lakes/ponds: acres. Other non-wetland waters: acres. List type of aquatic resource: . Wetlands: acres.
	Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply): Non-wetland waters (i.e., rivers, streams): linear feet, width (ft). Lakes/ponds: acres. Other non-wetland waters: acres. List type of aquatic resource: Wetlands: acres.
SEC	CTION IV: DATA SOURCES.
Α	SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below): Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: CDOT Data sheets prepared/submitted by or on behalf of the applicant/consultant. Office concurs with data sheets/delineation report. Office does not concur with data sheets/delineation report. Data sheets prepared by the Corps: Corps navigable waters' study: U.S. Geological Survey Hydrologic Atlas: USGS NHD data.
	USGS 8 and 12 digit HUC maps. U.S. Geological Survey map(s). Cite scale & quad name: 1:24000, Commerice City USDA Natural Resources Conservation Service Soil Survey. Citation: National wetlands inventory map(s). Cite name: State/Local wetland inventory map(s): FEMA/FIRM maps: 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929) Photographs: Aerial (Name & Date): Project Site
	or ☐ Other (Name & Date): Previous determination(s). File no. and date of response letter: Applicable/supporting case law: Rapanos and Carabell cases. Applicable/supporting scientific literature: Other information (please specify):

APPROVED JURISDICTIONAL DETERMINATION FORM U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A.	REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): July 1, 2013
В.	DISTRICT OFFICE, FILE NAME, AND NUMBER:
	Denver Regulatory Office, I-70 East, I-25 to Tower Road, NWO-2013-1163-DEN
c.	PROJECT LOCATION AND BACKGROUND INFORMATION: State: CO County/parish/borough: Denver City: Denver Center coordinates of site (lat/long in degree decimal format): Lat104.9776 N; Long. 39.7802 W Name of nearest waterbody: South Platte River Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: South Platte River Name of watershed or Hydrologic Unit Code (HUC): 10190003 Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request. Check if other sites (e.g., offsite mitigation sites, disposal sites, etc) are associated with this action and are recorded on a different JD form.
D.	REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY): Office (Desk) Determination. Date: July 1, 2013 Field Determination. Date(s):
	<u>CTION II: SUMMARY OF FINDINGS</u> RHA SECTION 10 DETERMINATION OF JURISDICTION.
	re Are no "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the ew area. [Required] Waters subject to the ebb and flow of the tide. Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain:
В.	CWA SECTION 404 DETERMINATION OF JURISDICTION.
The	re Are "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [Required]
	1. Waters of the U.S. a. Indicate presence of waters of U.S. in review area (check all that apply): TNWs, including territorial seas Wetlands adjacent to TNWs Relatively permanent waters ² (RPWs) that flow directly or indirectly into TNWs Non-RPWs that flow directly or indirectly into TNWs Wetlands directly abutting RPWs that flow directly or indirectly into TNWs Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs Impoundments of jurisdictional waters Isolated (interstate or intrastate) waters, including isolated wetlands
	b. Identify (estimate) size of waters of the U.S. in the review area: Non-wetland waters: South Platte River, 750 linear feet Wetlands: WET274-01 and WET274-02, approximately 0.03 acres.
	c. Limits (boundaries) of jurisdiction based on: 1987 Delineation Manual Elevation of established OHWM (if known):
	2. Non-regulated waters/wetlands (check if applicable): ³ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional.

Explain:

Boxes checked below shall be supported by completing the appropriate sections in Section III below.

² For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).

Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW

Identify TNW: South Platte River.

Summarize rationale supporting determination:

The South Platte River is a traditionally navigable water that was historically used for commerce, as cited in the 1974 navigability study prepared by Donald Spritzer, USACE. The South Platte River also hosts at least four known commercial outfitters offering rentals, shuttles and guided trips. In addition, the South Platte River is an interstate waters.

2. Wetland adjacent to TNW

Summarize rationale supporting conclusion that wetland is "adjacent": Wetlands are directly abutting OHWM of South Platte River.

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i)	General Area Conditions:
	Watershed size: Pick List
	Drainage area: Pick List
	Average annual rainfall: inches
	Average annual snowfall: inches
(ii)	Physical Characteristics:
()	(a) Relationship with TNW:
	Tributary flows directly into TNW.
	Tributary flows through Pick List tributaries before entering TNW.
	Project waters are Pick List river miles from TNW.
	Project waters are Pick List river miles from RPW.
	Project waters are Pick List aerial (straight) miles from TNW.
	Project waters are Pick List aerial (straight) miles from RPW.
	Project waters cross or serve as state boundaries. Explain: .

⁴ Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

		Identify flow route to TNW': Tributary stream order, if known: .
	(b)	General Tributary Characteristics (check all that apply): Tributary is: Natural Artificial (man-made). Explain: Manipulated (man-altered). Explain:
		Tributary properties with respect to top of bank (estimate): Average width: feet Average depth: feet Average side slopes: Pick List.
		Primary tributary substrate composition (check all that apply): Silts Sands Concrete Cobbles Gravel Muck Bedrock Vegetation. Type/% cover: Other. Explain:
		Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: Presence of run/riffle/pool complexes. Explain: Tributary geometry: Pick List Tributary gradient (approximate average slope): %
	(c)	Flow: Tributary provides for: Pick List Estimate average number of flow events in review area/year: Pick List Describe flow regime: Other information on duration and volume:
		Surface flow is: Pick List. Characteristics: .
		Subsurface flow: Pick List. Explain findings: Dye (or other) test performed:
		Tributary has (check all that apply): Bed and banks OHWM ⁶ (check all indicators that apply): clear, natural line impressed on the bank changes in the character of soil shelving vegetation matted down, bent, or absent leaf litter disturbed or washed away sediment deposition water staining other (list): Discontinuous OHWM. Explain:
		If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply): High Tide Line indicated by:
(iii)	Che Cha	mical Characteristics: racterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.). Explain: .

⁵ Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

⁶A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.

⁷Ibid.

		Ide	ntify specific pollutants, if known:
	(iv)		Riparian corridor. Characteristics (type, average width): Wetland fringe. Characteristics: Habitat for: Federally Listed species. Explain findings: Fish/spawn areas. Explain findings: Other environmentally-sensitive species. Explain findings: Aquatic/wildlife diversity. Explain findings:
2.	Cha	aract	teristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW
	(i)		ysical Characteristics: General Wetland Characteristics: Properties: Wetland size: acres Wetland type. Explain: Wetland quality. Explain: Project wetlands cross or serve as state boundaries. Explain:
		(b)	General Flow Relationship with Non-TNW: Flow is: Pick List. Explain:
			Surface flow is: Pick List Characteristics:
			Subsurface flow: Pick List. Explain findings: Dye (or other) test performed:
		(c)	Wetland Adjacency Determination with Non-TNW: Directly abutting Discrete wetland hydrologic connection. Explain: Ecological connection. Explain: Separated by berm/barrier. Explain:
		(d)	Proximity (Relationship) to TNW Project wetlands are Pick List river miles from TNW. Project waters are Pick List aerial (straight) miles from TNW. Flow is from: Pick List. Estimate approximate location of wetland as within the Pick List floodplain.
	(ii)	Cha	emical Characteristics: aracterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: attify specific pollutants, if known:
	(iii)	Bio	Riparian buffer. Characteristics (type, average width): Vegetation type/percent cover. Explain: Habitat for: Federally Listed species. Explain findings: Other environmentally-sensitive species. Explain findings: Aquatic/wildlife diversity. Explain findings:
3.	Cha	All	veristics of all wetlands adjacent to the tributary (if any) wetland(s) being considered in the cumulative analysis: Pick List proximately () acres in total are being considered in the cumulative analysis.
		For	each wetland, specify the following:
			Directly abuts? (Y/N) Size (in acres) Directly abuts? (Y/N) Size (in acres)
			Summarize overall biological, chemical and physical functions being performed:

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and
 other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

- 1. Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:
- 2. Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:
- 3. Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1.	TNWs and Adjacent Wetlands. Check all that apply and provide size estimates in review area: TNWs: linear feet width (ft), Or, acres. Wetlands adjacent to TNWs: acres.
2.	RPWs that flow directly or indirectly into TNWs. Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:
	Provide estimates for jurisdictional waters in the review area (check all that apply): Tributary waters: linear feet width (ft). Other non-wetland waters: acres. Identify type(s) of waters: .
3.	Non-RPWs ⁸ that flow directly or indirectly into TNWs. Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.
	Provide estimates for jurisdictional waters within the review area (check all that apply): Tributary waters: linear feet width (ft). Other non-wetland waters: acres.

⁸See Footnote # 3

E.

F.

4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs. Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands. Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:					
	Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:				
	Provide acreage estimates for jurisdictional wetlands in the review area; acres.				
5.	Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs. Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.				
	Provide acreage estimates for jurisdictional wetlands in the review area: acres.				
6.	Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs. Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.				
	Provide estimates for jurisdictional wetlands in the review area: acres.				
7.	Impoundments of jurisdictional waters. As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional. Demonstrate that impoundment was created from "waters of the U.S.," or Demonstrate that water meets the criteria for one of the categories presented above (1-6), or Demonstrate that water is isolated with a nexus to commerce (see E below).				
DE-	DLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, GRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY CH WATERS (CHECK ALL THAT APPLY): 10 which are or could be used by interstate or foreign travelers for recreational or other purposes. from which fish or shellfish are or could be taken and sold in interstate or foreign commerce. which are or could be used for industrial purposes by industries in interstate commerce. Interstate isolated waters. Explain: Other factors. Explain:				
Ide	ntify water body and summarize rationale supporting determination:				
	vide estimates for jurisdictional waters in the review area (check all that apply): Tributary waters: linear feet width (ft). Other non-wetland waters: acres. Identify type(s) of waters: . Wetlands: acres.				
	N-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY): If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements. Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce. Prior to the Jan 2001 Supreme Court decision in "SWANCC," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR). Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: Other: (explain, if not covered above):				

⁹ To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

¹⁰ Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos.

	facto	vide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR ors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional ament (check all that apply):					
		Non-wetland waters (i.e., rivers, streams): linear feet width (ft). Lakes/ponds: acres.					
		Other non-wetland waters: acres. List type of aquatic resource: Wetlands: acres.					
		vide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such ading is required for jurisdiction (check all that apply):					
		Non-wetland waters (i.e., rivers, streams): linear feet, width (ft). Lakes/ponds: acres.					
		Other non-wetland waters: acres. List type of aquatic resource: Wetlands: acres.					
SE(<u>CTIO</u>	N IV: DATA SOURCES.					
A. {	SUPI	PORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked					
		requested, appropriately reference sources below):					
	\boxtimes	Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant:					
		Data sheets prepared/submitted by or on behalf of the applicant/consultant.					
		Office concurs with data sheets/delineation report.					
	h-mins	Office does not concur with data sheets/delineation report.					
		Data sheets prepared by the Corps: .					
		Corps navigable waters' study:					
	X	U.S. Geological Survey Hydrologic Atlas: .					
		☐ USGS NHD data. ☐ USGS 8 and 12 digit HUC maps.					
		U.S. Geological Survey map(s). Cite scale & quad name:					
		USDA Natural Resources Conservation Service Soil Survey. Citation:					
	Ħ	National wetlands inventory map(s). Cite name:					
	Ħ	State/Local wetland inventory map(s): .					
		FEMA/FIRM maps: .					
		100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)					
		Photographs: Aerial (Name & Date):					
	(marri	or Other (Name & Date):					
	띩	Previous determination(s). File no. and date of response letter:					
	M	Applicable/supporting case law: Rapanos and Carabell cases.					
	H	Applicable/supporting scientific literature: Other information (please specify): Google Earth.					
	\$4.24	Onto Information (prease specify), cookie satur					

B. ADDITIONAL COMMENTS TO SUPPORT JD: